GUIDE

TO

EVERY-DAY KNOWLEDGE

BY THE

REV. DR. BREWER,

TRINITY HALL, CAMBRIDGE.

AUTHOR OF "GUIDE TO SCIENCE," "THEOLOGY IN SCIENCE," "H
TORY OF FRANCE," "THE YOUNG TUTOR." ETC.

CASSELL, PETTER, AND GALP

LONDON:
PETTER AND GALPIN, BELLE SAUVAGE PRINTING WORKS,
LUDGATE HILL, E.C.

50916C

PREFACE.

THIS GUIDE TO EVERY-DAY KNOWLEDGE was suggested by "Miss Burdett Coutts' Prizes for Common Things," and a hope is entertained by the Author that it will supply, at least in part, the want there complained of. As, however, it is designed for families and schools, only subjects of general interest could with propriety be introduced.

nard Street,
Russell Square, W.C.

CONTENTS.

PART I.—ARTS AND SCIENCES.

WOOL:

How it is obtained ... 9
Shearing sheep ... 10
The sheep 11
Stapling wool 13
Carding and combing 14
Wool fitted for weaving 15
Woollen manufactories 17

COTTON:

How prepared 22
Bleaching cotton cloth 24
Dyeing it 25
Calico printing 27
Cotton factories ... 28

SILK:

How prepared 30
Cocoons made into silk 31
Rearing silk worms ... 32
Silk manufactures ... 33

ATHER:

ather[illegible]at ...
[illegible]g leather
Currying leather
Sumach tanning
Tawing leather ...
Oil dressing ...
The leather trade

PAGE

BONES 45
Ivory 48

SOAP AND CANDLES:

Fat 49
Soap 51
Use of Soap 53
Candles 55

COAL:

What made from ... 56
Where found 57
Fire damp 58
What is fire 59
Uses of coal 61
How to feed a fire ... 61

HOW TO ACT IN CASE OF FIRE:

When a house is on fire 63
When a chimney is on fire
When bed curtains are on fire 67
When a dress is on fire
Incombustible dresses 68
Burns and Scalds ... 69

PAGE

GEMS and JEWELS:

The Diamond 72
Ruby 78
Emerald 79
Sapphire 80
Pearls 81
Topaz, Amethyst, Opal 84
The Agate family ... 85
Malachite, Jet 87

PAGE

THE METALS:
(Their qualities and uses.)

Gold 88
Silver 91
Copper 92
Iron 95
Zinc 101
Tin 102
Lead 104

PART II.—FOODS AND DRINKS.

BREAD:

The grain used 107
How wheat is prepared 110
The other ingredients 111
Chemical composition of bread 112
How bread is made ... 114
How to know good bread 117
Brown bread 118
Unleavened bread ... 119

BUTTER:

How to make it ... 122
Requisites for making 125
Colour of butter ... 126
Salt butter 126
Where it comes from 128
Rancid butter 129
Adulterations 130
Milk pans 131
Use of butter as a food 132

CHEESE:

How cheese is made . 136
The different sorts ... 137
The colouring matter 141
Cheese as a food ... 141

VEGETABLES FOR FOOD. 143

DIET:

What to eat 145
Hurried meals 148
Pickles as a food ... 149
Salads 149
Sugar and fruit ... 150
Drinking at meals ... 151

HINTS ON COOKING.

Meat 153
Potatoes 156
Other vegetables ... 157
To make jams ... 158

PART III.—REFUSE, WASTE, AND THINGS DESPISED.

PAGE

REFUSE AND WASTE:

Bone refuse 160
Offal of tanners ... 161
curriers 162
soap boilers ... 162
kitchens ... 163
fish 163
factories 164
Sweepings 166
Other refuse 167
Use of a dead horse . 170
Use of a dead dog ... 172

THINGS DESPISED:

Insects, use of 176
,, as food ... 176
,, for medicine. 178
,, in the arts ... 179

PAGE

THINGS DESPISED (*con.*):

Insects, for dyes ... 179
,, for lac 182
,, for wax ... 185
,, for honey ... 187
,, botanical use 189
,, as scavengers 194
,, counterchecks 197
,, as insect food 200
Recapitulation 204
Use of insects 204
Use of birds 206
The lesson taught ... 208
Mischief of ignorance 209
Use of worms, &c. ... 213
Use of vermin 214
Use of nettles 215
Use of east winds ... 216
Bad smells and pain 218

* * *

PART IV.—HINTS ABOUT COMMON THINGS.

ACCIDENTS:

Frostbite 220
Cuts and wounds ... 220
Stunned by a blow ... 222
Stunned by a fall ... 223
Cure for bruises ... 223
Skin chafed 224
Bites and stings ... 225
Something stuck in the throat 226

MALADIES:
(*Hints for the unprofessional.*)

Convulsions 227
Colds 228
Sore throat 231
Pain of the ear ... 232
Fainting fits 233
Fainting from heat ... 234
Bleeding from the nose... 235

PAGE
POISONING:
What to do always ... 238
General directions ... 239
Antidotes to acids ... 239
Poison from paints ... 240
Gripes from fruit ... 241
Saucepans 242
Mussels 243

DISINFECTANTS 244

MISCELLANEOUS HINTS:
How to take medicine 246
Preservation of eggs 246
Mouldiness prevented 246
To clean silver 248
,, remove ink spots . 248
,, ,, grease spots 249
,, clean decanters ... 250
,, remove tight rings 250

PAGE
MISCELLANEOUS HINTS:
To open stiff knives... 251
,, fix drawings... ... 252
Pocket-handkerchiefs 252
To wash clothes ... 253
Paint for iron 254
To clean paint 255
,, ,, casks 256
,, ward off vermin ... 256
,, break ice 257
,, fit stockings ... 258
The sizes of gloves ... 258
To waterproof boots . 258

AIR AND EXERCISE ... 259

PERSONAL CLEANLINESS 262

ALPHABETICAL INDEX... 265

* * *

GUIDE TO EVERY-DAY KNOWLEDGE.

PART I.

ARTS AND SCIENCES.

WOOL.

(1.—HOW IT IS OBTAINED.)

What is wool?

The hair-like covering of sheep.

How is it taken from the sheep?

It is cut off with shears.

What is the process called?

Shearing the sheep.

When is it cut off?

ometimes when the sheep is alive, and sometimes after it is slain.

When taken from the living sheep, what is the wool called?

Fleece-wool.

When taken from the dead sheep, what is i called?

Dead-wool.

Why is the latter inferior to the former?

Because it is more harsh, not so strong and dyes badly.

§ *How does the wool of sheep differ?*

The wool of some sheep is short, and of others long.

Which is the more valuable?

The short wool.

What is short wool used for?

For making cloth.

What is long wool used for?

For making worsted.

(2.—SHEARING THE LIVING SHEEP.)

§ *What is the usual time for shearing shee*

The months of April and May.

What is done before sheep are sheared?

They are well washed in a pond or stream.

What is this done for?

To clean the wool.

§ *Which part of the fleece is the best wool?*
That taken from the sheep's back.

Which is the next best part?
That taken from the shoulders and thighs.

Which part ranks next in quality?
That taken from the neck and hind-quarters.

Which part of the fleece is the least valuable?
That taken from the breast and belly.

(3.—THE SHEEP.)

What counties in England are most noted for long-woolled sheep?
Lincoln and Leicester.

What county is most noted for short-woolled

Sussex, which rears the famous South-Down breed.

How do long-woolled differ from short-woolled sheep?
The long-woolled sheep have no horns.

Where do our black-faced sheep come from?

The heaths of Yorkshire.

Where do our black-faced and black-legged sheep come from?

Norfolk; their wool is not worth much, and the breed is not valuable.

Why is the English sheep much esteemed?

Because its flesh makes the best mutton in the world.

How is its wool esteemed?

Not so much as that of some other countries.

What countries supply our best wools?

Germany and Australia.

What is German wool generally called?

Saxony wool, and the cloth made of it is called Saxony cloth.

What is English wool chiefly used for?

To make into worsted.

What is German wool used for?

To make into fine cloth.

What is Australian wool used for?

To make into other woollen goods.

What nation once supplied us with all our best wool?

Spain; but Germany and Austral have now almost driven Spain o of the market.

What does a fleece of foreign wool weigh?

From two pounds to two pounds a half.

What does a fleece of British wool weig

From six to eight pounds.

(4.—THE STAPLING OF SHORT OR CLOT WOOL.)

Who takes charge of the fleece next to the farmer?

The wool-stapler.

What does he do with it?

He staples it.

What is meant by "stapling" wool?

Sorting it into lots, according to the length and quality of its staple.

Name the three chief lots.

Super wool, livery wool, and grey wool.

What is super wool used for?

To make cloth, flannel, blankets, and tweeds.

What is livery wool used for?

To make liveries for soldiers and sailors, footmen and the police.

What is grey wool used for?

To make cloth for workhouse and prison dresses.

(5.—CARDING OR COMBING WOOL.)

Who takes the wool in hand after the stapler has sorted it?

The carder or comber.

Which wool is only carded?

Short wool.

§ *What is done with the long wool?*

It is sometimes carded, and sometimes combed, like flax.

What is then done with it?

The shorter and better sort is used for stockings and ladies' dresses

What is the longer sort used for?

Yarn.

What fabrics are made from this yarn?

Carpets, shalloons, stuffs, merinoes, and so on.

§ *What is carding?*

Drawing the wool through a sort of comb, called a card.

What is this done for?

To disentangle it, and lay all the hairs one way.

What is carded besides wool?

Cotton.

(6.—MANUFACTURE OF SHORT OR CLOTHING WOOL.)

§ *After the wool has been carded, what is done to it?*

It is oiled, sized, and spun.

What is then done with it?

It is woven into cloth.

§ *When the cloth is woven, how is it next treated?*

It is well scoured with potash and soap.

What is this done for?

To get rid of the oil and size.

§ *Who next takes it in hand?*

The fuller.

What does the fuller do with it?

He puts it into a machine, where it is beaten with huge wooden hammers.

What is this done for?

To full it; that is, fill up the little holes between the different threads.

How does this improve the cloth?

It makes it thicker, stronger, and more uniform.

What is next done to it?

Being again scoured, all the loose knots and hairs are picked out.

§ *Who next takes the cloth in hand?*

The teazers.

What do they do with it?

They throw it over a frame, and scra
the outer surface with
or a wire brush.

What are teazle-heads?

A sort of bur, which grows wild in England, and many other places.

Where do most of our teazles come from ?

France.

What is cloth teazled for ?

To scrape up a nap.

§ *What is the final process ?*

It is pressed, after all imperfections have been removed.

(7.—WOOLLEN AND WORSTED MANUFACTORIES.)

¶ *What is meant by "West of England cloths ?"*

Cloths made in the West of England; at one time considered the best in the world.

In what counties are these cloths made ?

Gloucester, Somerset, and Wilts.

What town in Gloucestershire is the centre of the cloth trade ?

Stroud; the centre of some twenty cloth-weaving towns.

What towns in Wiltshire are noted for their fine cloths ?

Bradford, Chippenham, and Trowbridge; all on the river Avon.

What cloths now equal those of the West of England?

The best Yorkshire cloths.

¶ *What towns in Yorkshire are most noted for their woollen and worsted goods?*

§ Leeds, Bradford, Halifax, and Huddersfield.

What is Leeds frequently termed?

The clothing metropolis of the world.

What fabrics does it manufacture?

All that are made of either woollen or flax.

What other trades are extensively followed in Leeds?

Machine-making, dyeing, and the leather trade.

§ *Why is the Yorkshire Bradford famous?*

It is the chief seat for spinning and weaving worsted yarn.

For what else is it famous?

For being the great mart of long wools, used in worsted manufactures.

What worsted cloths are made there in large quantities?

Reps, twills, stuffs, damasks, moreens, and so on.

What cloths partly of worsted and partly of cotton are made there?

Alpacas, paramattas, coburgs, Orleans cloth, damasks, and lains.

§ *For what is Halifax famous?*

The largest carpet-works in the whole world.

How does it rank as a manufacturing town?

Next to Leeds and Bradford.

What are its chief worsted fabrics?

Shalloons and serges, merinoes, moreens, and everlastings.

What are its chief woollen manufactures?

Broad and narrow cloth, baizes, and kerseymeres.

§ *For what is Huddersfield noted?*

For being the chief seat of what is termed the fancy trade.

What is meant by the "fancy trade?"

Articles made of worsted or wool with a pattern.

Name some of those articles made at Huddersfield in large quantities.

Waistcoat pieces and shawls.

¶ *What articles are made partly of silk and partly of worsted?*

Poplins and bombazines.

Where are poplins made?

In Ireland.

Where are bombazines made?

At Norwich, in Norfolk; also noted for its crape.

What is crape made of?

Raw silk, tightly twisted.

How is it made?

It is woven into a thin gauze, and dressed with gum.

What causes its wrinkled appearance?

Some of the fibres of the gummed silk shrink in drying more than others, and pull the fabric into puckers.

¶ *What towns in England are most noted for carpets?*

Halifax, and Wilton in Wiltshire.

What other towns in England are famed for making carpets?

Axminster in Devonshire, and Kidderminster in Worcestershire.

¶ *What towns in England are most noted for blankets?*

Witney in Oxfordshire, and Rochdale in Yorkshire.

¶ *What town in Scotland is noted for its shawls?*

Paisley; also famous for making cotton thread.

What shawls are made at Paisley?

Silk, cotton, worsted, woollen, and mixed.

COTTON.

(1.—HOW IT IS PREPARED.)

§ *What is cotton?*

A downy substance contained in the pod of the cotton shrub.

Where is the best cotton grown?

In Egypt, Brazil, and the United States.

Where else is the plant largely cultivated?

In the East Indies.

How long does the plant last?

It is found most profitable to sow new plants every year.

What was the value of the cotton sent from America before the war?

Above forty-eight million pounds sterling.

How are the cotton pods sent to England?

In large bags, containing about 300 pounds each.

§ *What is the first process that the pods undergo?*

They are carefully unpacked, cleansed, and disentangled.

What is next done?

All the fibres are laid in one direction.

How is this done?

By a carding machine or kind of comb.

After it is carded, what is done with it?

It is drawn into a uniform thickness, twisted and spun.

What are the final processes?

It is wound on bobbins and woven into cloth.

What is the weaving machine called?

A loom.

What is the difference between a hand-loom and a power-loom?

A hand-loom is worked by the hand, and a power-loom by steam.

What are the threads which run length-wise called?

The warp.

What are the threads which cross the warp called?

The weft.

(2.—BLEACHING COTTON CLOTH.)

If the woven cloth is to remain white, what is done with it?

It is bleached.

If it is to be coloured, what is done with it?

It is bleached and dyed.

If it is to receive a pattern, what is done?

It is bleached and printed.

How used we to bleach cloth?

We used to lay it on grass in the open air, to be bleached by the sun.

Where did we use to send many of our cloths to be sun-bleached?

To Holland, where there are large grassy plains fit for the purpose.

What name did this give rise to?

Linen cloth so bleached was called Holland.

How do we now bleach cloth?

With sulphuric acid, soda, bleaching powder, and six or seven washings.

(3.—DYEING COTTON CLOTH.)

If the cloth is to be dyed, what is next done?

After certain preparations, it is dipped by machines into liquid dye.

What dye is used to produce blue?

Indigo.

What dye is used to produce mauve and magenta?

A dye made from coal tar.

How are the white spots on a coloured ground made?

Several thicknesses of the cloth are placed between leaden plates with holes in them, and bleaching powder is poured into the holes.

What does this do?

It discharges the colour from the parts under the holes.

What articles are very often so ornamented?

Cotton pocket-handkerchiefs.

§ *What patterns for handkerchiefs sell best in England?*

Very simple patterns, such as spots, checks, and stripes.

What patterns for handkerchiefs sell best in China?

Birds, beasts, flowers, landscapes, and all sorts of natural objects.

What patterns for handkerchiefs sell best in Germany?

Copies of celebrated pictures and works of art, churches and abbeys, mansions and public buildings.

What patterns for handkerchiefs sell best in South America?

The most gaudy and flashy colours that can be devised, without regard to propriety or design.

(4.—CALICO PRINTING.)

How is a piece of calico or muslin printed?

The design is cut on metal or wood, and stamped on the cotton.

How is it stamped on the cotton?

Metal plates by machinery, wooden blocks by the hand.

What wood is used?

Sycamore.

Why are several colours more expensive than one?

Because each colour requires a new plate or block.

When metal plates are employed, how is the process done?

The device is engraved on a steel or copper roller.

How many colours will one roller print?

Only one; but the same machine will work several rollers at the same time.

How are the rollers fed with colour?

They feed themselves from a colour vat.

How is the superfluous colour removed?

It is cut off with a knife.

How long does it take to print a piece of cloth?

A good machine will print nearly a mile of cloth in an hour.

(5.—COTTON FACTORIES.)

What is a cotton factory?

A place fitted up for spinning or weaving cotton by machinery.

Which is the great cotton county?

Lancashire; as Yorkshire is the great woollen county.

What town is the metropolis of the cotton trade?

Manchester; as Leeds is of the woollen trade.

What town ranks next to Manchester?

Bolton; then Stockport, between Lancashire and Cheshire.

How far is Bolton from Manchester?

About ten miles to the north-west.

What famous inventors of cotton machinery were born at Bolton?

Arkwright and Crompton.

Where was Hargreaves born?

At Stanhill, near Bolton.

What machine did Arkwright invent?

The "twist-frame," to take the place of finger and thumb in spinning.

What machine did Hargreaves invent?

The "jenny," by which several spindles may be worked by one person.

What machine did Crompton invent?

The "mule," which combines together the twist-frame and jenny.

§ *What town in Lancashire is noted for its print and bleach works?*

Bury; about four miles east of Bolton.

§ *What district in Scotland rivals the Manchester district?*

The Glasgow.

Where else have we extensive cotton works?

In Cheshire, Yorkshire, and Derbyshire.

§ *What foreign countries are our best customers for cotton goods?*

Germany, China, and the East Indies.

What other foreign countries deal largely with us in cotton goods?

America, the British Colonies, Russia, Holland, and Belgium.

GUIDE TO

SILK.

(1.—HOW IT IS PRODUCED.)

What is silk?

A fine, soft, glossy thread, produced by an infant worm.

What is the worm called?

The silk-worm.

What is the infant silk-worm called?

The larva of the silk-worm.

How does this little creature make silk?

It draws it from its bowels, as a spider draws out its web.

What does it do this for?

To wrap round itself, as a nurse wraps a baby in a blanket.

What is the wrap called?

A cocoon′.

Why does the infant silk-worm wrap itself in a cocoon?

That it may not be hurt or eaten by birds while in a torpid state.

(2.—HOW COCOONS ARE MADE INTO SILK.)

§ *What is done with the cocoon?*

It is first put into hot water, and then the silk is spun into reels.

What is it put into hot water for?

To soften the gum, which would prevent the threads from being run off.

How is the silk run off into reels?

By means of a spinning-wheel.

What is it then called?

Raw silk.

§ *What is done with the raw silk?*

It is spun; that is, two or more threads are twisted together.

What is the silk in this condition called?

Spun silk.

§ *What is done with the spun silk?*

Some of it is scoured and dyed, and some is left its natural colour.

§ *What is the final process?*

The silk is woven into ribbons or cloth.

(3.—THE REARING OF SILK-WORMS.)

§ *What is the mother of the silk-worm?*

A large moth.

How are silk-worms propagated?

By eggs, which the moth lays.

When the eggs are hatched, what comes out of them?

A grub or small worm, called the larva.

What does the larva turn into?

After it has spun for itself a warm silk coffin, it turns into a chrysalis.

What is a chrysalis?

An apparently lifeless animal, without mouth, stomach, legs, or wings.

What is the last change of this strange insect?

The chrysalis becomes a winged moth, lays eggs, and dies.

§ *What food does the silk-worm eat?*

Its favourite food is mulberry leaves.

Where do we get our silk from?

Chiefly from India, France, and Turkey.

What other countries supply us largely with raw silk?

Italy, the Cape of Good Hope, and China.

Why do we not rear silk-worms more abundantly in England?

Because our mulberry leaves do not appear for two or three weeks after the eggs are hatched.

What does this oblige us to do?

To find some other sort of food for the young silk-worms.

What food do we give them till the mulberry leaves come out?

Lettuce leaves and dandelions; but the silk-worms do not thrive on them.

(4.—THE SILK MANUFACTURER.)

§ *Who taught us how to weave silk?*

Frenchmen, driven out of France by Louis XIV.

In what way did Louis XIV. drive his subjects out of France?

He said they must be Roman Catholics, or he would severely punish them.

How did he punish those who refused to be Roman Catholics?

Some he put to death, some he fined, and some he put to cruel tortures.

How many fled to England to avoid this ill treatment?

About fifty thousand.

Where did they settle?

Most of them in Spitalfields (London).

Why did they flee to England?

Because they knew they might live in peace there, and worship God as they thought proper.

§ *How many silk manufactories have we now in Great Britain?*

Above three hundred.

How many hands are employed in the silk trade?

At least a million.

§ *Where are our broad-silks chiefly made?*

At Spitalfields; Manchester, in Lancashire; and Macclesfield, in Cheshire.

Where are our best ribbons made?

At Coventry, in Warwickshire.

Where is our silk lace made?

At Nottingham, the chief seat of all machine-made lace.

Where were our first silk-mills set up?

At Derby (1719).

LEATHER.

(1.—HOW SKINS ARE MADE INTO LEATHER.)

What is glue made of?

Bits of skin, the clippings of hides, and other similar offal.

What substance, in these refuse, becomes glue?

That called gelatine.

What else, besides glue, is made of gelatine?

Size, isinglass, and table jelly.

What will melt gelatine?

Hot, but not cold water.

How do we get the gelatine out of skins and hides?

By boiling, which melts the gelatine.

How can we make gelatine incapable of being melted?

By tanning.

What is tanning?

Steeping skins or hides in oak-bark, or sumach powder.

What is this done for?

To prevent putrefaction.

What, besides oak-bark and sumach powder, is used for the conversion of skin to leather?

Sometimes alum, and sometimes oil.

When leather is prepared with alum, what is the process called?

Tawing.

When leather is prepared with oil, what is the process called?

Dressing.

§ *What leathers are tanned with oak-bark?*

All strong hides, such as those of the ox and cow, buffalo, calf, and horse.

What are those leathers used for?

The soles of shoes, harness, mill-bands, and so on.

What foreign countries supply us largely with ox and cow hides?

Monte-vid'eo and Buenos Ayres, in South America; Northern Germany, and Russia.

Where do we get most of our buffalo hides from?

The East Indies and America.

Where do we get most of our horse hides from?

The pampas of South America.

What are the pampas?

Enormous plains, to the south of Buenos Ayres (*Airs*).

How are the American hides sent to England?

They are dried and preserved in salt.

§ *What skins are tanned with sumach?*

Goat, sheep, lamb, seal, and calf.

What fancy leather is made of goat skins?

Morocco.

What is imitation morocco made of?

Lamb-skins.

What is it called?

Roan.

What are morocco and roan used for?

Coach-linings, chair and sofa covers, book-binding, and so on.

What are tanned sheep-skins used for?

Chiefly for furniture and book-binding.

What are tanned calf-skins used for?

The upper leather of shoes, and book-binding.

What are seal-skins used for?

Patent leather," bags, dressing-cases, and other ornamental uses.

From what countries do we import large quantities of sheep and lamb skins?

Australia, the Cape of Good Hope, and the East Indies.

What European countries supply us also with these skins?

Italy, Germany, and Spain.

§ *How is Russia leather tanned?*

With willow or birch bark, which gives it its peculiar perfume.

Why is Russia leather especially valuable?

Because moths and other insects will never touch it.

What hint should this give us?

Always to have some books in our libraries bound in Russia leather.

§ *What skins are tawed,* i. e., *prepared with alum?*

Kid and dog, sheep and lamb, small calf and hog.

For what are kid, lamb, and dog used?

Gloves and ladies' shoes.

For what are tawed sheep and calf skins used?

Aprons, shoe-linings, and other inferior uses.

What are hog-skins used for?

Chiefly for saddles.

Why are they never tanned?

Because they contain too much fat for the process.

§ *What skins are only dressed with oil?*

Sheep, deer, and goat skins.

What are sheep skins dressed with oil used for?

To make wash-leather.

What are deer-skins used for?

Gloves and gaiters.

What is this sort of leather called?

Shammy, a corruption of chamois, the Alpine goat.

§ *What is the difference between a hide and a skin?*

Hides are large skins, such as are tanned with oak bark; all others are called skins.

(2.—TANNING.)

What is done to the hides and skins before they are tanned, tawed, or dressed?

They are well cleaned, and all the hair is taken off.

How is the hair taken off?

The hides or skins are soaked for several days in lime water, and the hair is then scraped off with a knife.

What is then done with them?

The lime is removed.

How is this done?

By steeping the skins in a mixture of sulphuric acid, bran, and water.

How are the hides tanned?

They are put into a tan pit, where they remain for eight months or more.

Is there no means of quickening this process?

Several attempts have been made with partial success, but the old plan is not yet given up.

What next is done to the hides?

They are dried, and some are sent to the currier to be dressed.

What leather is not dressed by the currier?

That intended for the soles of shoes.

(3.—CURRYING LEATHER.)

What is currying leather?

Shaving it into a uniform thickness, and soaking it with dubbing.

What is dubbing?

A mixture of oil and tallow.

What else is done to it?

It is dried, rubbed with pumice-stone, beaten, smoothed, and blackened.

How is it blackened?

With oil, tallow, and lamp-black.

(4.—SUMACH TANNING.)

When sumach is used instead of oak-bark, how are the skins tanned?

They are made into bags, and filled with sumach powder and water.

How long are they left so?

About twenty-four hours.

What is done with the hair scraped off the skins?

It is sold to the carpet-maker and plasterer.

What does the plasterer do with it?

Mixes it with his mortar and plaster, to make them stick.

After skins have been sumached, what is done with them?

They are dyed.

What is used for the red dye?

Cochineal.

What is used for the black dye?

Iron.

How are seal skins enamelled?

They are japanned with a varnish made for the purpose.

(5.—TAWING LEATHER.)

What is tawing leather?

Preparing it with alum instead of tanning it.

What difference does this make?

Tanned leather cannot be made into glue, but tawed leather can.

Why so?

Because in tanned leather the nature of the gelatine is entirely changed, but in tawed leather it is not so.

What does tawing do to it?

It merely prevents the leather from putrefying.

How does tawed leather differ from tanned leather?

It is softer, more pliant, and may be used undyed.

What are tawed leathers used for?

Gloves and ladies' shoes.

What country supplies us with kid?

Italy; but "kid" boots and gloves are made of lamb-skins.

When the skins are cleaned and unhaired, what is done to them?

They are well shaken in a tub containing alum, salt, and water.

What else is added for the best skins?

Flour and the yolk of eggs.

(6.—LEATHER DRESSED WITH OIL.)

What leather is dressed with oil only?

Shammy and wash leather.

How are they dressed?

The oil is forced into them by machinery.

What sort of machine is used?

Two heavy hammers worked by steam, which beat the oil into the skins.

How often is the process repeated?

Till a hundred skins have sopped up two or three gallons of oil.

(7.—THE LEATHER TRADE.)

Where are the chief tan-yards of England?

At Bermondsey, in London.

Which are the chief seats of our shoe trade?

London, Northampton, and Norwich.

Which are the chief seats of our glove trade?

Worcester and London.

Where else are they made in large quantities?

At Limerick, in Ireland; Leominster, in Hereford; and Yeovil (*Yo-vil*), in Somerset.

BONES.

What are bones chiefly composed of?

Gelatine, fat, and lime.

§ *What articles are made of bones?*

Combs, handles of all sorts, paper-knives, and various other articles.

Where are these articles chiefly made?

At Birmingham and Sheffield.

Where are these two towns?

Birmingham in Warwickshire, and Sheffield in Yorkshire.

§ *What should be done with bones in private houses?*

They should be used for soup.

Why are they good for soup?

Because they supply jelly, and give richness to the soup.

§ *What merchants buy up bones to a great extent?*

Soap and candle makers.

How do they use them?

They break them and boil them down to get out the fat.

Where does the fat of bones lie?

In the centre of round bones, and in the little cavities of all.

What is the fat in the middle of round bones called?

Marrow.

§ *When all the fat is got out, what can then be done with the bones?*

They can be made into bone-black or animal charcoal.

How can this be done?

By burning them.

For what is bone-black or animal charcoal used?

For bleaching sugar.

How is sugar bleached by bone-black?

The liquid sugar is made to ooze through a layer of bone-black, and comes out quite white.

What becomes of the colouring matter and impurities which it had before?

The bone-black absorbs them.

When the sugar-refiner has done with the bone-black, what is it good for?

It can be used for lucifer matches, for refining metal, and for manure.

§ *What crop is most benefited by bone manure?*

Turnips.

How can sterile lands be very often made fertile?

By using bone manure.

What county has been greatly benefited by the use of this manure?

Cheshire, which was at one period almost sterile.

What benefit has Cheshire received from bone-dressing?

Her dairy produce has been doubled.

(2.—IVORY.)

What is the best sort of bone called?

Ivory.

What bone is called ivory?

The long tusks of elephants.

How many elephants' tusks are brought to England every year?

As many as fifty thousand.

Where are they brought from?

Africa and the East Indies.

Where do the best come from?

The Gold Coast, in Africa.

Wherein does the African elephant differ from the Asiatic?

In Africa, both the male and female elephant have tusks; but only the male elephant in Asia.

What articles are made of ivory?

Handles of all sorts, combs, tooth brushes, tablets, and billiard-balls.

What is done with the scrapings, shavings, and sawdust of ivory?

Some is used by pastry-cooks, some by straw-hat makers, and some to harden steel.

What do pastry-cooks do with the refuse ivory?

They boil it into jelly.

Why is this jelly valuable?

Because it is easily made, and keeps a long time without getting bad.

SOAP AND CANDLES.

(1.—FAT.)

§ *What is lard?*

The fat of pigs prepared for food.

What is suet?

The hard fat found about the loins and kidneys of sheep and oxen.

What is butter?

The fat of milk and cream, obtained by churning.

What is oil?

Liquid fat, either animal or vegetable.

What is tallow?

All sorts of melted fat, separated from the meaty fibre.

What substances besides animals contain fat?

Fish, vegetables, sugar, starch, and indeed almost all foods.

How do cows and sheep get fat on grass?

From the starch and sugar which the grass contains.

Why do people in cold climates eat more fat than those in warm countries?

Because fat helps to warm the body, and "to keep out the cold."

What is goose fat good for?

Chapped hands.

§ *What is train oil?*

The oil obtained from whales.

What is it used for?

Dressing leather, making soap, and some other purposes.

Who are the largest whale-fishers in the world?

The North Americans.

§ *What is cold-drawn oil?*

The oil of seals.

Where are the head-quarters of this trade?

At St. John's, the capital of Newfoundland.

§ *Where is our cod-liver oil prepared?*

In London, Norway, Newfoundland, and the East Indies.

Where does London obtain almost all its cod-fish from?

The sea between Yarmouth and the Nore.

Where else is cod-fish taken for home use?

Off the coasts of Lincoln, Norfolk, Suffolk, and Essex.

(2.—SOAP.)

What is soap?

The salt of a fatty acid.

What are fatty acids?

The acids of suet and oil.

What is the difference between suet and oil?

Suet is the solid and oil the liquid part of fat.

What is the solid part of fat called?

Stearine, from a Greek word meaning suet (*stear*).

What is the acid of stearine called?

Ste'aric acid.

What is the liquid part of fat called?

O′-le-ine, from a Latin word meaning oil (*oleum*).

What is the acid of oleine called?

O′-le-ic acid.

How are suet and oil (stearine *and* oleine) *converted into acids?*

By taking from them the sugar or sweetening substance.

What is this sweetening substance called?

Glycerine (*glis′-se-reen*), from a Greek word which means sweet (*glycys*).

How can the sugar or glycerine of the fat be driven out?

By boiling soda or potash with the fat.

What does the soda do?

It combines with the fatty acids, and converts them into soap.

§ *What is the best soap?*

White curd.

How is it made?

With olive or palm oil, and soda.

How is common yellow soap made?

With tallow, resin, and soda.

What is glycerine soap?

Soap made from the very substance driven out of the fat, when it was converted into soap.

What is Naples soap?

A soap made in Naples of fish oil.

What is soft soap?

Soap made of potash instead of soda, or of fish oil instead of other fat.

(3.—THE USE OF SOAP.)

Who use more soap than any other people of the whole world?

The English.

How does soap clean our hands and dirty

It dissolves the grease and releases the dirt mixed with it.

How do our hands and face get greasy?

The grease oozes from our body through the pores of the skin.

How does the grease get dirty?

Soot and dust fall on it, and the dirt of things we touch sticks to it.

How does linen get greasy?

From the perspiration of the body.

Why do washerwomen add soda to water?

To make more soap.

How does soda make more soap?

It combines with the grease of dirty linen, and converts it into soap.

What soap chaps the skin most?

That which contains too much soda.

Why does too much soda chap the hands?

Because it dissolves a part of the outer skin, leaving the surface rough.

What soap is the best for washing our hands and face?

The hardest we can buy.

(4.—CANDLES.)

What are candles made of?

Tallow, wax, the solid part of cocoanut oil, and other fatty matters.

How are wax candles made?

Melted wax is poured over the warm wick, and the candle is then rolled between two flat pieces of wood.

Why are kitchen candles called dips?

Because they are made by dipping wicks into melted tallow.

Why do not kitchen candles give a better light?

Because the sugar or glycerine impedes the combustion of the tallow.

When a kitchen candle is blown out, what is it that causes the offensive smell?

The glycerine in the tallow, which also makes the candles soft.

SALAR JUNG LIBRARY

What common candles are made without the glycerine?

Composite candles.

What are composite candles made of?

Fatty acids and the solid part of cocoa-nut oil.

* * *

COAL.

(1.—WHAT COALS ARE MADE FROM.)

What are coals

Fossil wood.

What is meant by fossil wood?

Wood reduced to a substance like stone.

What were coals once?

Beautiful green trees of enormous height.

What sort of trees?

Club-mosses, sixty feet high, tall ferns, and monster reeds.

How were these trees made into coals?

They were buried and reduced to fossils.

How did they get buried?

The wind and the rain drove mud an sand over them.

How were they reduced to fossils?

The vegetable parts were destroye and the mineral parts left hind.

(2.—WHERE COALS ARE FOUND.)

Where are coals found?

In mines, under the surface of the earth.

In what way are they deposited?

In beds or layers.

Where are our largest coal fields?

In the North of Britain.

In which of our six northern counties?

Northumberland, Durham, Cumberland, Lancashire, and York.

In what other English counties do they abound?

In Derby, Stafford, and Nottingham.

Where else have we large coal fields?

In Wales, Scotland, and Ireland.

Where are the greatest coal fields of the world?

In North America.

(3.—FIRE DAMP.)

Of what is wood composed?

Of carbon and two gases, in nearly equal parts.

What are the two gases?

Hydrogen and oxygen.

Of what is coal composed?

Of the same three elements, but in different proportions.

What change takes place when wood is reduced to coal?

The carbon remains, but most of the two gases disappears.

What is the consequence?

Coal is almost all carbon.

What becomes of the hydrogen ?

Some of it escapes, some becomes water, and some fire-damp.

What is fire-damp ?

The same sort of gas as we use in our street lamps.

(4.—WHAT IS A FIRE.)

When coal is heated, what change takes place ?

The oxygen of the air unites with the coal.

What does the union do ?

It converts almost all the coal into vapour and gas.

What gas ?

Carbonic acid.

What produces the heat ?

Letting loose the sun-beams packed in the coal.

What are these warehoused sun-beams called ?

Latent heat.

Why are they so called?

Because their heat is *hidden* in the coals, and cannot be felt till it is let loose.

What else, besides coal, contains latent heat?

Everything contains more or less of this warehoused heat.

How does it affect substances?

The quantity warehoused determines whether a substance shall be solid, liquid, or vapour.

Which contain the least quantity?

Vapour and gas.

Which the most?

Solid substances.

When solids are converted into vapours, what change takes place?

Some of the stored heat escapes.

When coals are burning, what becomes of their stored heat?

It escapes from the fuel, and warms everything it touches.

(5.—USES OF COAL.)

What is coal used for?

Fuel, to warm houses.

What else is it used for?

To convert ore into metal, and water into steam.

What is the use of steam?

To make machines move.

What machines?

Those that move railway carriages, packets, and ships.

What other machines?

Those that set in motion power-looms, cotton-mills, and steam-hammers.

Of what value is coal to England?

It is one of its chief sources of wealth.

What is our other chief source of wealth?

Iron.

(6.—HOW TO PUT COALS ON A FIRE.)

When you put fresh coals on a fire, how should you do it?

Bring the hot cinders to the front, and put the fresh coals behind.

Why so?

Because then the gases rise between the two, get ignited, and make a warm blaze.

If the fresh coals are put on the top of the hot cinders, how do they act?

They form a lid between the fire and the chimney, so that the air above the fire remains cold.

What is the result?

The gases rise through the coals, but do not ignite into a blaze.

§ *When a fire is poked, what must be done?*

The hard cake of coal on the top must be broken.

What else should be done?

The grate should be cleared of dust and fine cinders.

Why so?

To let air pass through into the heart of the fire.

Why should the upper crust be broken?

That the gases may rise through and get ignited.

HOW TO ACT IN CASE OF FIRE.

(1.—WHEN A HOUSE IS ON FIRE.)

¶ *If a house is on fire, what should* BYSTANDERS *do?*

Send immediately for a fire-engine, and give the alarm.

What is the next thing they should do?

Use every effort to save the inmates before they think about the furniture.

What is the third thing?

Collect bedding at the foot of the house, if possible.

What for?

To break the fall, if any of the inmates jump from the windows.

How many beds should be collected?

The more the better; bed should be piled on bed, if possible.

¶ *What should the* INMATES *do?*

If in bed, each one should wrap a blanket round him, and carry another in his hand.

What does he carry a blanket in his hand for?

To throw over the flames, if he has to tread upon them.

What else would be excellent to do?

To throw a wet silk handkerchief, or any small article of flannel, over the head and face.

If the room is full of smoke, what is the best way of crossing it?

On hands and knees.

Why so?

Because smoke ascends, and the floor is more free from smoke than any other part of the room.

What would be excellent to do, if possible?

To put a wet or damp sponge in the mouth.

What for?

To keep the smoke from our lungs.

§ *If you cannot escape by door or roof, what should you do?*

Make to the front window, and close the door.

§ *What ought the* MASTER *to do?*

See that all the household are present.

What should then be done?

Make a rope of any articles at hand, such as sheets, curtains, and so on.

Where should one end be fastened?

To a bed-post, iron bar, or anything convenient.

What are the inmates to do?

Let themselves down by this means as fast as possible.

What window should never be selected?

One over an area.

What window should be selected, if possible?

One over a portico or pent-house.

What for?

To shorten the distance.

§ (1) *What caution is of the utmost moment?*

Open no door or window, except to aid escape.

(2) *What else?*

Shut every door after you.

(3) *What other caution should be observed?*

Never jump from a window if there is the least chance of escape in any other way.

(4) *What else should we strive to do?*

Avoid hurry, and keep our wits about us.

What would be the best way of throwing a child from a window?

Wrap it in pillows, and let it down feet foremost.

How should the pillows be fastened?

Bind them round the child with sheets.

(2.—WHEN A CHIMNEY IS ON FIRE.)

If a chimney is on fire, what should you do?

Hold something as a screen before the opening of the fire-place.

What is this done for?

To prevent the fumes from descending into the room, and fresh air from getting into the chimney.

What would be best to hold before the opening of the fire-place?

A hearth-rug, blanket, piece of carpet, or woollen table-cloth.

What would be good to do with it, if possible?

Make it thoroughly wet.

Why should it be wet?

Because then no fumes or air could pass through it.

What should we not *do?*

We should in no wise open, or leave open, any door or window.

(3.—WHEN BED-CURTAINS ARE ON FIRE.)

If your bed-curtains catch fire, what should you do?

Lay hold of any woollen article, and beat the flames out, if possible.

If the flames have got too much head to be beaten out, what should you do?

Snatch instantly from the bed every article of cotton or linen.

What then?

Throw blankets and carpets over the flame—wet, if possible.

What should you not *do?*
In no wise open either door or window.

(4.—WHEN A DRESS IS ON FIRE.)

If our dress catches fire, what should we do?
Throw ourselves on the floor, and roll over and over to put the flames out.

If any one is by, what should he do?
Wrap a hearth-rug, coat, or woollen table-cloth over the person in flames.

What should the person in flames not *do?*
Leave the room, or run about it, or remain in an upright position.

(5.—INCOMBUSTIBLE DRESSES.)

How can ladies' dresses be made incombustible?
By a little tungstate* of soda, which costs only a shilling a pound.

How should it be used?
If the dress is starched, add one part of tungstate to three of starch.

---

* Tungsten is a metal; tungstic acid is the metal tungsten combined with oxygen; tungstate is a mineral salt formed of tungstic acid and a base; and in tungstate of soda that base is soda.

If the dress is not starched, how is it to be

Put about a handful of tungstate into the tub of water.

What will be the effect?

Muslin, cotton, or linen, so washed, would not burn, even if held in a flame.

(6.—BURN OR SCALD.)

(1) SLIGHT WOUNDS.

§ *If a person is slightly burnt, what should he do?*

Anything to keep the air from the wound.

Why should the air be kept from the wound?

Because it is the air which causes the pain, and inflames the wound.

What is the best remedy in such a case?

A piece of plaister.

What is the best plaister?

Spermaceti, spread on thin leather.

What is the next best plaister?

Common soap plaister.

If these things are not at hand, what should be done instead?

Wrap the wound in wadding.

§ *If the wound is too slight for such a remedy, what should be done?*

Foment the wound with ether.

What is the next best thing?

A little olive oil, or laudanum and turpentine in equal quantities.

(2) SEVERE BURNS.

§ *If the skin is broken, what should be done?*

Dredge flour over the wound.

How much flour?

Enough to dry up all the moisture which comes from the wound.

What is better still?

Plaister the wound with whitening, made into a paste.

How is it to be made into a paste?

With linseed or olive oil.

How thick is the paste to be made?

as liquid honey.

How should it be thinned?

Add a little vinegar till it is reduced to the thickness of treacle.

How should the paste be applied?

With a brush or feather.

What will be the effect?

Instant relief.

If the pain returns, what should be done?

Put on more of the whitening plaister, till the pain ceases.

§ *Whether flour or whitening is used, how long should it remain?*

Till the wound is healed.

How can it be removed without difficulty?

By putting on a common poultice, when it will come off without trouble.

N.B.—Of course a medical man should be sent for immediately, if the burn is at all severe; but the directions given are the best that can be given to persons not in the profession.

GEMS OR JEWELS.

(1.—THE DIAMOND.)

¶ *What is the diamond?*

The most valuable of all jewels.

For what is it remarkable?

It is the hardest, most transparent and brilliant, of all known substances.

Give a proof of its great hardness?

It will scratch anything, but cannot itself be scratched, except with a diamond.

How are diamonds employed on account of their great hardness?

Glaziers use them for cutting glass.

What are the best diamonds called?

Diamonds of the "first water."

Why are they so called?

Because they are clear and transparent as water.

How are diamonds sometimes tinted?

Some are a pale rose colour, and some are slightly blue, yellow, or brown.

Whence do we get almost all our diamonds?

From the diamond mines of Brazil, in South America.

What Indian mines are famous for diamonds?

Those of Golconda, in Hindustan.

In what state are they found?

Buried in lumps of earth.

How are they discovered?

When the lumps are broken up and washed, the diamonds are discovered by their sparkle.

Into what forms are diamonds cut?

Some into brilliants, and others into rose diamonds.

How is the value of a diamond estimated?

According to the square, of its carats.

What is a carat?

A small weight of four grains, used for weighing jewels.

What is the value of a wrought diamond weighing one carat?

About £8.

What is the value of a diamond four times as large?

Four-times-four as much as a diamond weighing one carat (£128).

What is the value of a diamond weighing twelve carats?

Twelve-times-twelve as much as a diamond weighing one carat (£1,152).

¶ *What is the largest diamond in the world?*

The Braganza diamond, which weighs 1,680 carats, or twelve ounces.

To whom does it belong?

To the Emperor of Brazil, in South America.

§ *What is the next largest diamond in the world?*

One belonging to the Rajah of Mattan, in Borneo.

How large is this diamond?

It weighs 367 carats, is of the purest water, and shaped like an egg.

§ *What diamond comes next?*

The Koh-i-nor, which belongs to Queen Victoria.

Where was the Koh-i-nor found?

In the mines of Golconda, in Hindustan.

How came it into the hands of the English?

When that part of India called the Punjaub was added to our possessions, it was given up to our army.

How large was it before it was cut?

They say it was 900 carats.

How much does it weigh now?

Only 123 carats. It is rose-cut.

What is its value?

About £120,000.

What is the meaning of Koh-i-nor?

Mountain-of-light.

§ *What diamond ranks next to the Koh-i-nor?*

The "Star of the South," found in Brazil, in 1853.

How much does it weigh?

Somewhat more than 254 carats.

§ *To whom does the Orlow diamond belong?*

The Emperor of Russia.

What is the size of it?

It weighs 195 carats.

Of whom was it bought?

Of a Greek merchant.

What was given for it?

As much as £90,000, and an annuity of £4,000 for life.

§ *To whom does the famous Regent or Pitt diamond belong?*

To the King of Prussia.

How large was it before it was cut?

About 136 carats. It is one of the most brilliant in the world.

Why is it called the Pitt diamond?

Because it once belonged to Mr. Pitt.

Who was Mr. Pitt?

The grandfather of the famous Earl of Chatham.

Why is it called the Regent diamond?

Because the Duke of Orleans, while he was Regent of France, bought it.

What did he give for it?

As much as £130,000.

What great emperor afterwards had it, and wore it on his sword hilt?

Napoleon I., Emperor of the French.

How came it into the hands of the King of Prussia?

It was taken by the Prussians at the battle of Waterloo.

§ *What is the size of the great Austrian diamond?*

It weighs 139 carats.

What is its defect?

It is slightly tinged with yellow.

What is it worth?

About £100,000.

§ *What is the famous Sancy* (Sarn-see) *diamond?*

One of 106 carats, which once belonged to the Duke of Burgundy.

How came it to be called Sancy?

Because a French gentleman of that name bought it.

Where was it found?

On the battle-field where the Duke of Burgundy was slain.

Who has it now?

A Russian nobleman.

What did he pay for it?

About £80,000, English money.

§ *What other celebrated diamond belonged to the Duke of Burgundy?*

One now valued at £12,000.

Where was this diamond found?

On the same battle-field, by a soldier, who sold it for five shillings.

What became of it?

It was bought by a dealer, then by the Republic of Gen′oa, then by Pope Julius II. for £5,000.

Into whose hands did it then pass?

Into the hands of the Great Mogul.

Where is it now?

In the Pope's tiara.

What is the Pope's tiara?

His triple crown.

(2.—THE RUBY.)

What precious stone ranks next to the diamond?

The ruby.

Of what colour is the ruby?

A rich crimson or carmine red.

Where are rubies found?

Only in the Island of Ceylon, off the south-east coast of Hindustan.

What is the value of a ruby?

A perfect one is more valuable than a diamond.

§ *What are very deep-coloured rubies called?*

Carbuncles.

Who has the largest ruby in the world?

The Emperor of Russia.

Where is it set?

In the imperial crown.

§ *What stone resembles a carbuncle?*

A garnet.

Where do garnets come from?

Ceylon, India, and Syria.

Where do European garnets come from?

The mountainous parts of England and Scotland, Spain, Bohemia, and Hungary.

(3.—THE EMERALD.)

What precious stone ranks next in value?

The emerald.

What is the value of an emerald?

About half that of a diamond.

Where are the finest emeralds found?

In Peru and Brazil, in South America.

What is their great drawback?

They are scarcely ever found without a flaw.

Why is Ireland called "The Emerald Isle?"

Because it is covered with grass as bright and green as an emerald.

(4.—THE SAPPHIRE.)

What precious stone ranks next in value to the emerald?

The sapphire.

What colour is it?

A beautiful blue.

Where do the best come from?

Pegu, in Burmah; which belongs to England.

What is the value of a sapphire?

About one-third that of a diamond.

Where is the finest in the world?

In the Paris museum.

What is it valued at?

The enormous sum of £40,000.

(5.—PEARLS.)

What is a pearl?

A gem of great value, but not a precious stone.

How are pearls produced?

By a kind of disease in the shell of the pearl oyster.

What vegetable substance is produced in a somewhat similar way?

Gall-nuts, which are produced by a disease in the leaves of oak-trees.

What is the cause of disease in both cases?

The introduction of some foreign substance.

Where are the best pearl oysters found?

Off the west coast of Ceylon, and about Ormuz in the Persian Gulf.

Where else are they caught?

Near the Pearl Islands in the West Indies, and in the bay of Pan′ama′.

What is the place where they cluster called?

A pearl bank.

How are pearl oysters taken?

Men dive into the sea to find them.

What is the meaning of the word pearl?

A little pear.

Why are they so called?

Because they are shaped like a pear.

How is the value of a pearl estimated?

By its size and silvery brightness.

Who held pearls in the highest estimation?

The ancient Jews and Romans.

Show that the Jews did so.

Our Lord compares the "kingdom of God" to a pearl of great price, for which a wise merchant will give all the money he is worth.

§ *What was the value of Cleopatra's famous pearl ear-rings?*

Above £100,000.

Who was Cleopatra?

A queen of ancient Egypt.

What did she do with one of these ear-rinsg in a fit of foolish extravagance?

She threw it into a cup containing some sort of liquid, waited till it had melted, and then drank it.

What did she do this silly feat for ?

To astonish Mark Antony, with whom she was in love.

What became of the other ear-ring ?

At the death of Cleopatra it fell into the hands of Augustus.

To whom did Augustus give it ?

To his daughter Julia.

Who is said to have imitated this foolery ?

Sir Thomas Gresham.

On what occasion ?

When he drank to the health of Queen Elizabeth, at the opening of the Royal Exchange.

¶ *What is mother of pearl ?*

The hard silvery lining of several sorts of shells.

What is it used for ?

Buttons, handles, toys, and ornaments.

What is its chief beauty ?

Its play of colours, according to the way in which the light falls on it.

(6.—TOPAZ, AMETHYST, AND OPAL.)

Name the precious stones most esteemed next to the true gems.

The topaz, amethyst, and opal.

What is the nature of all these stones?

They are all rock-crystal (*quartz*).

§ *Of what colour is a topaz?*

Golden yellow.

Where do the best come from?

Siberia.

What Scotch pebble is a variety of the topaz?

The cairn-gorm.

§ *What is the meaning of amethyst?*

The "antidote of drunkenness."

Why is this precious stone so called?

Because the ancient Greeks supposed, if a man wore an amethyst ring, wine would not intoxicate him.

Who always wear an amethyst ring?

The Roman Catholic bishops.

What is their amethyst ring called?

Their pastoral ring.

§ *What is the colour of an opal?*

A pale blue.

Why are opals so much admired?

From their play of colour, in whic they resemble mother of pearl.

(7.—THE AGATE FAMILY—QUARTZ.)

§ *What is agate?*

A half-transparent stone, of whic there are many varieties.

What is the name derived from?

Achatës, a river in Sicily, where agat abound.

§ *What is the onyx?*

A species of agate, with parallel streak of different colours.

What is the meaning of the word?

The nail-stone.

Why is it so called?

Because the white stripe resembles th white of the human nail.

§ *What is the sard-onyx?*

A sort of onyx, of an orange colou striped with blue, brown, and red.

What is the meaning of sard?

Red agate.

What, then, is the meaning of sardonyx?

The red-agate nail-stone.

§ *What is cornelian?*

A species of agate, capable of a fine polish.

Of what colours is it?

Blood-red, flesh-colour, reddish brown, and milk-white.

Where is it highly prized?

In the East, where it ranks next to the precious stones.

§ *What is jasper?*

A species of agate, sometimes red, yellow, or green, and sometimes streaked or spotted.

Where is there a shrine of jasper?

At Cologne Cathedral, in Prussia.

What is it used for?

It is said to contain the skulls of the three Magi, *What three Magi?*

Those who presented gifts to the infant Jesus.

How are these three Magi styled?

The "Three Kings of Cologne."

What names have they given them?

Kaspar, Melchior, and Balthazar.

(8.—MALACHITE.)

What is malachite?

A carbonate of copper, found in masses in Siberia.

Of what colour is it?

A beautiful green, streaked like marble.

What curiosity in malachite was shown in London at the first Great Exhibition (1851).

Two complete doors, made entirely of this substance.

(9.—JET.)

What is jet?

A sort of coal, capable of a high polish.

What is the name derived from?

The river Gagës, in Asia Minor, where it abounds.

What was it once called?

Gagatës, which was first shortened into Gatës, and then into gat or jet.

Where is it pretty common?

In France, Spain, and Germany.

Where is the most found in England?

At Whitby, in Yorkshire.

THE METALS.

(1.—GOLD.)

§ *What is gold?*

The most precious of all metals.

What are its peculiar properties?

It can be beaten into thinner leaves, and drawn out in wire to a greater length, than any other substance.

What other peculiarities belong to gold?

It is one of the heaviest of the metals, and the air does not injure it.

How much space could a sovereign be made to cover, if beaten into gold leaf?

The floor, ceiling, and walls, of four ordinary sized rooms.

If drawn into wire, how far could a sovereign be made to extend?

From Scotland to the British Channel.

§ *Where is gold found?*

In mines; scattered loose over extensive regions; and in the sands of rivers.

Where are the best gold mines of Europe?

In Hungary and Transylvania.

Where else are there valuable gold mines?

In Mexico and in Africa.

In what state is gold found in mines?

As ore, that is, mixed with other substances.

How is it separated?

Generally, the ore is put into a furnace, and the dross melted from it.

What are gold regions called?

The diggings.

In what state is gold found in the diggings?

In small and large lumps called "nuggets."

Why are these regions called diggings ?
Because persons dig up the earth, sift and wash it, and then pick out all the pieces of gold they can find.

What gold regions were discovered in 1847 ?
Those of California.

Where is California ?
West of Mexico, in North America.

What gold regions were discovered in 1851 ?
Those of Australia.

What gold regions have been discovered since ?
Those of British Columbia, Nova Scotia, and New Zealand.

Where are gold sands most abundant ?
In Africa and South America.

Where is gold dust gathered in Africa ?
South of the Great Desert.

Where is it gathered in South America ?
In Brazil, Chili, and New Gren'ada.

What country supplies the greatest quantity of such gold ?
Brazil.

How is this gold obtained?

It is separated from the sand of the river by frequent washings.

What ancient king is proverbial for wealth?

Crœsus, King of Lydia, in Asia Minor.

How did he obtain his wealth?

From the gold sands of the river Pac-to´-lus, now of no value

(2.—SILVER.)

What is silver?

A metal of a brilliant white colour, of great value.

In what does silver excel gold?

In lustre and hardness. It is also more elastic and sonorous.

In what is it inferior to gold?

It is very liable to tarnish, and cannot be beaten out into such fine leaves.

In what states is silver found?

Sometimes *native*, and sometimes as *ore*.

What is a "native" metal?

Metal in its native or pure state.

What is "ore" metal?

Metal mixed with foreign substances.

Where are the best silver mines in the world?

In Mexico, Peru, and Chili, all in America.

What mines of Peru are very celebrated?

Those of Mount Po-to´si, which are pierced in 5,000 different places, and employ more than 2,000 miners.

Where else do large quantities come from?

Siberia, Buenos Ayres (*Airs*), Columbia, and the United States.

Where are the best silver mines of Europe?

In Hungary and Transylvania, Norway and Saxony.

Where does the largest quantity of silver come from?

That supplied from America is more than twelve times as great as that supplied by the Old World.

(3.—COPPER.)

§ *What is copper?*

A reddish brown metal, more sonorous than any other.

What is the word derived from?

The Island Cyprus, in the Mediterranean Sea.

What did the ancient Greeks call it?

Cyprian brass.

In what does it resemble gold and silver?

It can, like them, be beaten into fine leaves, or drawn into very fine wire.

What is its worst property?

It soon tarnishes, and then gathers a poisonous green fur.

What is this green fur called?

Verdigris.

For what is verdigris used?

For green paint. It is also mixed with logwood in black dye.

§ *In what states is copper found?*

Both in the native state and also in the form of ore.

How can copper ore be known?

By its green film.

Where have the largest masses of pure copper been found?

In Brazil, and to the south of Lake Superior in North America.

How large a lump has been found in Brazil?

One weighing nearly 3,000 pounds.

What sized lump has been found in North America?

One measuring fifteen feet round.

Where are the largest and best copper mines in the world?

In Cornwall.

Where else do large supplies come from?

The Island of Cuba, Chili in South America, and Australia.

In what rocks are veins of copper found?

In granite, and clay-slate called killas; but the best veins are where these two rocks join.

§ *What is bell-metal?*

A mixture of copper and tin.

What is bronze?

A similar mixture, only with less tin.

What is brass?
A mixture of copper and zinc.

What is pinchbeck, or prince's-metal?
A similar mixture, only with less zinc.

Why is it called Prince's metal?
From Prince Rupert, who invented it.

(4.—IRON.)

What is iron?
The commonest and by far the most useful of all metals.

What are its peculiar features?
It is the hardest, most tenacious, and, next to tin, the lightest of all metals.

Where is it found?
In almost every part of the world.

Why is it called the most useful of all metals?
Because it is equally useful in art, science, agriculture, and war.

Where is the best iron of the world found?
In Sweden and Great Britain.

What are the three great iron districts of Great Britain ?

South Staffordshire, South Wales, and Central Scotland, each of which produces about equal quantities.

Where are the South Staffordshire works ?

At Dudley.

Where are the great Welsh iron-works ?

At Merthyr Tydvil, Glamorgan-shire.

Where are the great Scotch iron-works ?

At Carron, in Stirling-shire, and in the valley of the Clyde, near Glasgow.

Where are the other iron-works of Britain ?

In Shropshire, Derby, North Stafford, Gloucester, and West Yorkshire.

Where are the chief Shropshire iron-works ?

At Colebrooke Dale, on the banks of the Severn.

Where are the Gloucester iron-works ?

In the Forest of Dean.

Where are the great Yorkshire iron-works ?

At Rotherham.

Where are the chief Russian iron-works?

In the Ural Mountains, between Europe and Asia.

§ *In what state is iron found?*

In the state of ore.

What is the ore first made into?

Cast iron.

What is cast iron?

Iron ore melted in a furnace, and run off into channels.

What are these channels called?

The main gutter is called a *sow*, and its branches *pigs*.

What is iron in this state called?

Pig iron, from the side channels into which it runs and gets cool.

How is pig iron converted into wrought or forged iron?

It is puddled, beaten with huge hammers, and cut into bars.

What is "puddling" cast iron?

Driving out those impurities which make it brittle.

What are those impurities?

The oxygen and carbon which the cast iron contains.

When these are driven out, how is the character of the iron changed?

It is no longer brittle, but malleable.

What is meant by "malleable?"

Capable of being spread out by beating.

What would be the effect of beating on cast iron?

It would be instantly broken.

§ *What is steel?*

Bar-iron heated in earthen pots with charcoal and bone shavings.

What is this done for?

To make it whiter and of closer grain.

What is the good of making the grains closer?

The metal will then bear a better polish.

How is steel hardened or tempered?

By plunging it, while hot, into cold water.

What is the object of hardening steel?

To make it capable of receiving and keeping a sharp edge.

§ *What is shear steel?*

Common steel forged or wrought a second time.

How is this done?

The common steel bars are broken up, made white hot, and then beaten with immense hammers.

What are these immense hammers called?

Shear hammers.

Why are they so called?

Because they *shear*, that is, weld or join together, the broken pieces of steel by beating them.

Why is shear steel better than common steel?

Because it has no blisters, the grain is finer and more uniform, and the metal is altogether more tenacious.

§ *How can shear steel be still further wrought?*

It can be wrought into cast steel, the best steel that can be made.

How is cast steel made?

The shear steel is broken up and thrown into furnaces underground till it is melted.

What is then done with the molten metal?

It is poured into moulds, and rolled into sheets at the rolling-mill.

¶ *What is cast iron used for?*

Heavy engineering work, ornamental purposes, and cooking vessels.

Mention some ornamental purposes for which cast iron is used.

Fire grates, balconies, railings, tables and chairs, fenders, and so on.

What is forged or wrought iron used for?

Hard-ware, such as locks and keys, screws and nails; also for railways, bridges, and steam-ships.

What is steel used for?

Bright stoves, fenders and fire-irons, railway axles, and field guns.

What are shear and cast steel used for?

Cutlery and sharp tools, such as swords, knives and scissors, carpenter's tools and medical instruments.

(5.—ZINC.)

What is zinc?

A metal of a bluish-white colour, resembling a mixture of lead and tin.

What are its general features?

It is hard to file, but easily broken with the hammer; tough, and not much affected by the air.

How is it found?

Only in the state of ore.

Where is it found?

In Derbyshire, Belgium, Prussia, and many other places.

How is the ore treated?

It is heated with carbon, reduced to powder, and put into a furnace.

How is the zinc separated?

It rises in a cloud of steam, and meeting with cold water is chilled.

What then becomes of it?

It drops as solid metal into a receiver.

What is zinc used for?

Baths and cisterns, water spouts and gas-pipes, roofing, and so on.

What is its great merit?

After it is tarnished, it suffers no further change from the weather.

(6.—TIN.)

What is tin?

A metal of a greyish-white colour, not unlike silver.

In what states is it found?

Sometimes in veins mixed with other metals, and sometimes in masses or grains.

What is block tin?

Vein tin freed from the metals with which it is mixed, or refuse tin when the best part has been taken away.

What is tin in grains or masses called?

Stream tin.

What are the properties of tin?
It is soft, and easily beaten by hammers into thin sheets.

Where are the best tin mines?
In Cornwall.

What is tin used for?
For making or coating pots and pans.

What cooking vessels are coated with tin?
Those made of iron and copper.

Why is the inside of iron pots tinned?
To prevent their rusting.

Why is the inside of copper saucepans tinned?
To prevent their poisoning the food cooked in them.

Why does copper poison food?
Because it impregnates food with copperas, which is a rank poison.

When may copper saucepans be safely used?
When they are kept very clean, and food is not left to cool in them.

How are pots and pans tinned?
The inside is first rubbed over with ammonia, and then liquid tin is put into them.

How is the vessel coated?
It is moved about by the hand till the tin has passed over every part of it.

What does tin mixed with copper make?
Bronze and bell metal.

What does tin mixed with lead make?
Pewter.

§ *What is tin plate?*
Thin plates of iron dipped into liquid tin.

What effect has this on the iron?
The tin not only covers the surface of the iron, but soaks into its very substance.

(7.—LEAD.)

What is lead?
A metal of a bluish-grey colour.

What are its properties?

It is soft, easily bent, and as easily hammered out into thin sheets.

In what state is it found?

In the state of ore.

How is it separated?

It is crushed, melted in a furnace, and run off into "pigs."

What are these "pigs?"

The side branches of the gutter through which the liquid metal runs.

What does it do in these pigs?

It lies there till it gets cool.

Where are the best lead mines?

In Cumberland, which produces more lead than all the rest of Britain.

Where else are there large lead mines?

In Flintshire and Denbigh-shire, both in Wales.

Name some other counties of England where there are lead mines?

Derby and Shropshire, Devon and Cornwall.

What is lead used for?

House-gutters, water-pipes, cisterns, shot, and other purposes.

§ *What is white lead?*

A white powder made from lead and used for paint.

PART II.

FOODS AND DRINKS.

BREAD.

(1.—THE GRAIN USED FOR BREAD.)

¶ *What grain is generally used in England for bread?*

Wheat.

What other grains are sometimes used?

Barley, rye, oats, and rice.

Why does wheat make the best bread?

Because the bread made of it is lighter and more nourishing than any other.

What grain is next best to wheat for bread?

Maize or Indian corn.

§ *What substances are often added to wheat to cheapen the price of bread?*

Rice and potatoes.

What effect has the mixture of rice on bread?

It makes the bread less nutritious and more weighty.

Why does it make the bread more weighty?

Because the flour of rice absorbs more water than the flour of wheat.

What effect have potatoes on it?

Some think they improve the bread.

Why so?

Because they make it moister and lighter.

What do bakers call potato flour?

Fruit.

How much "fruit" is used?

Eight pounds to a sack of flour, but cheap bakers use more.

§ *What drug is often put into bread?*

Alum, to whiten it.

What other purpose does it serve?

It prevents the loaves from sticking to each other.

How does this serve the bakers?

It enables them to pull the loaves apart more easily and smoothly.

What bad effects has alum on bread?

It makes it less nutritious, more tough, and harder to digest.

If children are fed on alumed bread, what are they subject to?

The rickets.

How does it affect their bones?

It makes them small and weak.

Why so?

Because it decomposes the phosphate of lime which the wheat contains.

What use is the phosphate of lime?

It makes bone.

If bread is deprived of it, what then?

It contains no bone-making substance.

¶ *Where does the best wheat grow?*

In warm southern countries.

Where does wheat of inferior qualities grow?

In cold northern countries.

Which is the better, Scotch or English wheat?

English wheat.

What is better still than English wheat?

That from Southern Germany, Italy, and Egypt.

§ *Name the best wheat counties of England.*

Kent and Essex, Hertford and Berks, Hampshire and Hereford.

What places produce the largest returns per acre?

The neighbourhood of Chichester in Sussex, and Epsom in Surrey.

(2.—HOW WHEAT IS PREPARED FOR BREAD.)

How must wheat be prepared before it can be used for bread?

It must be ground into flour.

How is it ground into flour?

It is sent to the mill and crushed between heavy stones.

Into what two parts is it thus divided?

Into bran and flour.

What is the bran?

The skin or outer coating of the wheat.

What is done with the bran?

It is wholly or partly sifted from the flour.

How many different sorts of flour does wheat make?

Three: Firsts, seconds, and thirds.

What is firsts or pastry whites?

Flour from which all the bran has been sifted.

What is seconds or household flour?

Flour in which some of the bran is left.

What is the flour called thirds?

Flour in which a still larger quantity of bran is left.

What effect has the bran on the flour?

It makes it darker and cheaper.

What is done with the rest of the bran sifted from the flour?

It is used for feeding horses, pigs, and other animals.

(3.—THE OTHER INGREDIENTS OF BREAD BESIDES FLOUR.)

What besides flour is necessary for bread?

Salt, water, and "ferment."

What is used for ferment?

Yeast, leaven, barm, or gas.

Which of these is generally used in private families?

Yeast.

What is yeast?

The froth or scum of new beer "on the work."

What is leaven?
Sour dough.

What is the object of "ferment?"
To supply carbon´ic acid, in order to aid fermentation.

What effect does fermentation produce?
It makes the bread spongy and light.

(4.—CHEMICAL COMPOSITION OF BREAD.)

What is the chief part of wheaten bread?
Starch (*about 54 per cent*).

Of what does half the residue consist?
Of gum, sugar, and fibre.

What are the other ingredients?
Glu´ten and albu´men.

§ *What is gluten?*
A glutinous or sticky substance, something like bird-lime.

How can you separate the gluten from the flour?
Thus: Put a little flour in a muslin bag; dip it in water; and squeeze it with your fingers.

How long must you keep on doing this?

Till the water which runs from the bag is no longer tinged with white.

What will the residue in the bag be?

Gluten.

§ *How can you come at the starch?*

By letting the water settle till it is clear.

What will become of the white particles?

They will fall to the bottom.

What is this sediment?

The starch of the flour.

§ *What is albu′men?*

The white of an egg.

What else is called albumen?

Any similar substance, whether in animals or vegetables.

Where is albumen found in meat?

Between the fibres.

What effect has it on the meat?

It makes it tender and savoury.

§ *Which are the more easy to digest, small or large loaves?*

Small ones.

Why are small loaves the more digestible?

Because the products of fermentation escape from them more completely.

Why else are small loaves to be preferred?

Because the crust is more wholesome.

Why is the crust more wholesome?

Because the oven employed does not require to be so hot.

Which are the sweeter, small or large loaves?

Small ones.

Why so?

Because they are more fully freed from the products of fermentation.

(5.—HOW BREAD IS MADE.)

Of what articles is bread made?

Yeast, mixed with salt and water, added to some flour.

How are these articles mixed together?

They are well worked together with the hands.

What is this "working" called?

Kneading.

How long must the mass be kneaded?

Till every part of it becomes ropy.

What is this ropy substance called?

Sponge.

What is done with the sponge?

It is covered with a cloth, and set before a fire for an hour and a half.*

What takes place?

It swells and increases in bulk.

Why does it so?

Because a vast number of bubbles are formed in the dough.

What forms these bubbles?

The carbonic acid gas produced by fermentation.

How does carbonic acid form these bubbles?

In struggles to get out, but is constantly impeded by the sticky nature of the dough.

What is the result?

It pushes the dough into numberless little holes or bubbles.

---

* **Bakers allow their dough to stand for five or six hours, during which time the "sponge" rises *twice*. The first rising is allowed to subside, and when the second rising begins, water, salt, and a little alum are well mixed into the mass, the rising is then completed, and the batch is baked.**

How does fermentation produce carbonic acid gas?

By the action of the yeast on the sugar of the flour.

What effect does this action produce?

It converts the sugar into al′cohol and carbonic acid gas.

What is the good of these gas bubbles?

They make the dough light and porous.

If left too long before the fire, what would be the result?

The bread would be sour and heavy.

Why would it be sour?

Because the fermentation would go on, and convert the al′cohol to vinegar.

§ *What is the final process?*

The sponge is divided into loaves and baked.

What effect does the hot oven produce?

It swells the dough still more, dries it, boils the starch and glu′ten, kills the yeast, and stops the fermen′tation,

§ *What is the weight of a sack of flour?*

280 lbs.

How many pounds of bread will it make?

360; that is, 180 two-pound loaves.

Which is the cheaper, flour or bread?

Bread.

(6.—HOW TO KNOW GOOD WHEATEN BREAD.)

§ *When one loaf is torn from another, how should the severed parts look?*

Rough and ragged.

If the loaves part cleanly, what does it show?

That alum has been used in the bread.

§ *When a loaf is cut up, how should it look*

Spongy and full of holes.

§ *When a piece of bread is rubbed between the fingers, how should it behave?*

It should crumble easily into a coarse powder.

If it will not do so, what would you infer?

That alum has been used.

§ *When a piece of bread is soaked in water, how should it behave?*

It should swell uniformly, and sop up the water.

If alum has been used, what will it do instead?

It will be lumpy, and not swell uniformly.

§ *What other effects will alum produce?*

It will give the bread a sour taste, and cause it to bite less "short."

(7.—BROWN BREAD.)

Of what is brown bread made?

Undressed wheat, called meal.

What is undressed wheat or meal?

Flour of wheat with the bran in.

What effect does the bran produce?

It acts as an aperient.

Which is the more nutritious, white bread or brown?

White bread.

Why is not brown bread so nutritious as white?

Because it passes out of the stomach before it is well digested.

Which stays hunger the longer?

Wheaten bread, because it remains longer in the stomach.

(8.—UNLEAVENED BREAD.)

§ *What grain is a good deal used for bread in Scotland?*

Coarsely ground oatmeal.

What do the Scotch call this sort of bread?

Oaten cakes.

How are they made?

The meal is moistened with salt and water, kneaded, and rolled out thin.

What is done with these thin "rolls?"

They are baked or roasted before a good fire.

§ *What other grain is used for bread in Scotland?*

Barley-meal and pease-meal.

How are these meals made up?

In the same way as oatmeal.

What are barley and pease cakes called?

Bannocks.

§ *What are Scotch* scones*?*

Wheat-flour made up like oaten cakes.

What do the Jews call these scones?

Unleavened bread.

Why do they so call them?

Because they contain no leaven, yeast or other "ferment."

When do they eat them?

At Easter time.

Why do they eat unleavened bread then?

To remind them that they left Egypt in such great haste that they had no time to leaven their bread.

§ *What unleavened bread is made in England?*

Sailors' and captains' biscuits.

What is the difference between these biscuits?

Sailors' biscuits are made of *coarse* and captains' of *fine* wheat.

Why are these biscuits used on board ship?

Because they do not become mouldy and unfit for food, like common bread, by being kept.

How are they made?

Merely of wheat-flour, water, and salt.

How long are they baked?

For a quarter of an hour.

What is then done with them?

They are removed to a "hot room," where they remain for two or three days.

What is the object of this "second baking?"

To expel all the moisture, that the cakes may not grow mouldy by being kept.

Why are they made into cakes and not into loaves?

That the inside may be thoroughly dried as well as the outside.

Why are they called biscuits?

Because they are twice baked. (Fr. *bis*, twice; *cuit*, baked.)

BUTTER.

(1.—HOW TO MAKE BUTTER.)

§ *What is butter?*

The fatty part of cow's milk.

How can this fatty part of milk be detected?

By a microscope.

How does milk appear when so examined?

A number of little fatty globules are seen floating in it.

What are these globules?

Little bundles of butter or fat.

From which part of the milk is butter obtained?

From the cream.

What is the cream of milk?

The fat globules which rise to the surface when milk is "set."

How does it form on the surface?

Into a thick white scum, which may be skimmed off.

Why does it rise to the surface?

Because it is lighter than the other part of the milk.

What is done with this cream?

It is put into a deep earthen jar.

How long is it kept?

Till enough has been collected for a *churning*.

§ *What is a churn?*

A tub or box for making cream into butter.

What ought the churn to do?

Thoroughly shake all the cream.

What for?

To break the fat globules, and throw them together into a lump.

At what rate should the churn move?

At a moderate and uniform rate.

If the churning is done too fast, what will happen?

The butter will be soft and frothy.

If it is done too slowly, what will happen?

The butter will be strong and nasty.

§ *When all the butter "is come," what is done with it?*

It is taken from the churn to be washed and kneaded.

Why is it washed?

To take away its strong rancid taste.

Why is it kneaded?

To squeeze out all the butter-milk.

What is next done?

The butter is made up.

What is meant by being "made up?"

Weighed into pounds and made into shape.

What is the usual shape of butter?

Thick round masses, about five or six inches long.

Into what form is butter made up in Cambridge?

Into thin rolls or sticks, a yard long.

Why is it made into this shape?

For the convenience of the students, who are allowed two lumps of an inch long for breakfast.

What is the more usual way of serving out such small quantities?

They are usually made into pats, bearing some ornamental device.

Into what sized masses is butter made up in Norfolk?

Into "pints," which equal twenty ounces, or a pound and a quarter.

(2.—REQUISITES IN MAKING BUTTER.)

In making butter, what is all important?

That every vessel and hand employed be cool, sweet, and exquisitely clean.

Where should butter be made?

In a room where there is plenty of fresh air, and no smells of any kind.

What rooms must be avoided?

Rooms where stores are kept, or where persons sleep, live, take their meals, or smoke.

What persons ought never to make butter?

Those who are not in good health, or have hot damp hands.

Why should not such persons make butter?

Because the butter they make will have a nasty putrid taste.

If any vessel employed is not quite clean, how will it affect the butter?

It will make it rancid and disagreeable.

(3.—COLOUR OF BUTTER.)

What is the colour of the best butter?

A rich delicate yellow.

What gives it this rich yellow colour?

The richness of the pasture on which the cows feed.

What is the rule?

The richer the pasture, the richer the yellow colour of the butter.

How is this colour often imitated when butter is pale?

By some colouring matter.

What colouring matter is generally used?

That called arnotte.

What is arnotte?

A colouring matter obtained from the arnotte tree.

Where does this tree grow?

In South America.

What other things are sometimes used?

Saffron and the juice of carrots.

(4.—SALT BUTTER.)

What is done to butter to preserve it?

Salt is added to it.

What is the proportion?
Half an ounce to two pounds, if butter is to be eaten within a fortnight.

If it is to be kept longer, how much salt must be added?
As much as an ounce to a pound.

How is the salt to be added?
It is to be well kneaded into the butter.

What is such butter called?
Salt butter.

What is butter without salt called?
Fresh butter.

How is salt butter packed down?
In tubs, called kegs and firkins.

What is the size of a keg?
It contains about eighty-four pounds, but is no exact measure.

What is the size of a firkin?
It contains about fifty-six pounds, bu the quantity varies.

If a less quantity is required, what is done?
It is put into a half or quarter keg or firkin.

In these tubs, what caution is indispensable?
That they be exquisitely clean and free from smell.

(5.—WHERE BUTTER COMES FROM.)

Where does almost all our salt butter come from?
Holland, Belgium, and France.

How much butter is annually imported from these countries?
About 20,000 tons.

Where is the best English butter made?
In the neighbourhood of Aylesbury (Buckinghamshire), at Epping in Essex, and Cam-bridge.

What butter is nearly equal to Epping butter?
That made in Somerset, Gloucester, and Oxford.

Whence is the London market supplied with the best fresh butter?
From the Vale of Aylesbury.

In what form is it sent to London?
In two-pound lumps.

What counties supply London very largely with other butter?

Dorset and Devon.

In what form is it sent to London?

In firkins and kegs, or parts of those quantities.

How much butter is consumed in London alone every year?

About 15,000 tons.

What countries receive large quantities of Irish butter?

Portugal and Brazil.

§ *Are buttercups good for cows to eat?*

No, they never eat them.

Why are they called buttercups?

Because they grow only on dry, old pastures, which are good for butter.

(6.—RANCID BUTTER.)

How does stale butter taste?

Rancid.

What gives it this taste?

An acid, or thin oily liquid in the butter.

What is this acid or rancid oil called?

Buty′ric acid, or the acid of butter.

How is it formed?

The air acts on the butter, and converts a part of it into this acid.

How can the rancid taste be removed?

By washing and kneading the butter afresh in strong salt and water.

What else is sometimes used with partial success?

Carbonate of soda instead of salt.

What effect has the soda on the butter?

It neutralises the acid, from which the rancid taste arises.

§ *What else gives butter a disagreeable flavour?*

Feeding the cows on inferior or improper food.

What is meant by inferior food?

Poor pastures, where weeds are abundant and the grass is rank.

(7.—ADULTERATION OF BUTTER.)

How is butter adulterated?

With water, dripping, and mutton fat.

§ *How may the first be detected?*

By the wetness of the butter when squeezed.

What is the object of this adulteration?

Merely to make the butter weigh more.

§ *How may dripping and fat be detected?*

By the white particles apparent when the butter is newly cut.

(8.—MILK AND CREAM PANS.)

¶ *Why should not milk be kept in zinc or leaden pans?*

Because the acid of the milk attacks the metal, and forms a mineral salt.

What is the acid of milk called?

Lactic acid, from *lac*, the Latin for milk.

What is the mineral salt referred to called?

The lactate of zinc or lead.

How does this mineral salt affect the milk?

It dissolves in the milk, and gives it a disagreeable taste.

What ill effect has it on the eater?

If present in large quantities it will produce nausea, or even colic.

¶ *What is Devonshire colic?*

Colic produced by cider, in which lead has been dissolved.

What is the action?

The acid of the cider forms with the lead a poisonous mineral salt.

What is the acid of cider called?

Ma'lic acid, from *malum*, the Latin for an apple.

What is the acid of cider and apples called?

Ma'lic acid.

(9.—USE OF BUTTER AS A FOOD.)

§ *What is the use of butter as a food?*

It affords a pleasant way of adding fat to those foods which require it.

What is the use of fat in food?

It assists digestion, and greatly aids the conversion of starch into flesh.

If food is deficient in fat, what will be its effect?

It will irritate the stomach, and not nourish it properly.

§ *Why do we eat butter or meat with* BREAD?

Because it aids the conversion of the starch of bread into flesh.

Why do we not eat butter with CAKE?

Because butter was added when the cake was made, and more is not required.

§ *Why are not* POTATOES *alone a nourishing diet?*

Because they contain starch, but no fat or flesh-making stuff.

What will greatly improve their nourishing quality?

A slice of bacon, or a little butter, gravy, or dripping.

§ *Why should* RICE *and* ARROWROOT *be boiled in milk?*

Because they are almost pure starch, and require the fat of milk to make them wholesome.

§ *Why do we eat melted butter with boiled* RABBITS, FOWLS, *and white* FISH?

Because they contain in themselves too little fat.

Why do we eat ONION-SAUCE *with boiled rabbits?*

Because onions contain a rich supply of flesh-making stuff, of which rabbits are very deficient.

Why do we not eat melted butter with roast fowls?

Because they are basted with grease, and served with gravy.

Why do we not eat melted butter with EELS?

Because they are extremely rich in fat, and more would be disagreeable.

What proportion of fat do they contain compared with skate?

Nearly twenty times as much.

§ *Why do we eat butter or bread and butter with* EGGS?

Because the white of eggs contains no fat at all.

What is often eaten with eggs instead of butter?

Bacon. Eggs and bacon are a favourite and wholesome mixture.

§ *Why are* BEANS *and* PEAS *a good mixture with* PORK?

Because pork is rich in fat and poor in flesh-making stuff, but beans and peas are just the contrary.

What else is good with beans and peas?

Fat bacon. But they should never be eaten without grease in some form.

§ *Why are* TURNIPS *a good mixture with fat boiled* MUTTON?

Because they are very nutritious, but are deficient in that which the fat mutton supplies.

§ *Why cannot* BEES, *fed on sugar alone, make* WAX?

Because sugar contains no fat.

What must be added to assist them in their work?

A little fat in any convenient form.

When this is supplied, what will be the result?

They will be able to make plenty of wax.

CHEESE.

(1.—HOW CHEESE IS MADE.)

Of what is cheese made?

The curd of milk.

How is the curd separated from the milk?

By putting a little liquid rennet into the milk.

What is rennet?

The prepared inner membrane of a calf's stomach.

How long does it take to free the curd from the milk?

About half an hour.

What is done with the curd?

The whey is pressed out of it, and the curd chopped up into small pieces.

What is then done?

Salt being added, the pieces are wrapped in a cloth, and put into a shape full of holes.

What is the last process?

The shape is placed for two or three days in a cheese-press.

What is it placed in a cheese-press for ?

To squeeze out all the whey, and press the curd into a solid mass.

How is the cheese treated while it remains in the press ?

It is turned every two or three hours.

When taken from the press, what is done ?

It is placed on a shelf in a dry, airy room.

How long is it before the cheese is fit to eat ?

About six months.

(2.—DIFFERENT SORTS OF CHEESE.)

Why do cheeses differ in quality and taste ?

Chiefly because the milk is treated in a different way.

What else affects their quality and taste ?

The food which the cows eat.

What is skimmed-milk cheese ?

Cheese made of milk, from which the cream has been skimmed off.

What is whole-milk cheese ?

Cheese made of milk, which has not been skimmed.

What difference does this make?

Whole-milk cheese contains the butter as well as the curd of the milk.

Which is the richer and better?

Whole-milk cheese.

§ *What is the best English cheese called?*

Stilton.

Why is it so called?

From Stilton, a village in Huntingdon.

Where is it chiefly made?

Round about Melton-Mowbray, in Leicester-shire.

How is Stilton cheese made?

With a double quantity of cream.

How is this managed?

The cream of the evening meal is added to the new milk of the following morning.

§ *What is the next best English cheese?*

That called Cheshire.

Where is it made?

In Cheshire, and that part of Shropshire which borders on it.

How many cows are kept in Cheshire?

Above 100,000.

How many tons of cheese are made there?

Above 14,000 tons yearly, for the London market alone.

§ *What is our best red cheese?*

Double Glo'ster.

Where is this cheese made?

In Glo'ster-shire, and that part of Wilt-shire which borders on it.

What is the difference between double and single Glo'ster?

Double Glo'ster is a whole-milk cheese, but single Glo'ster a half and half.

What is meant by a half and half cheese?

A cheese made from half skimmed and half new milk.

In what part of Glo'ster is the best cheese made?

At Berkeley, famous for both single and double Glo'ster.

What other counties are noted for cheese?

Derby-shire and Warwick-shire.

§ *What is Cheddar cheese?*

A whole-milk cheese, the curd of which is well scalded with hot whey.

Where is it made?

At the village called Cheddar, in Somerset-shire.

What foreign cheese does it resemble?

Parmesan.

§ *Where is Parmesan cheese made?*

At Parma, in Italy.

To what does it owe its rich flavour?

To the excellent pasture on the banks of the River Po.

§ *What is Suffolk cheese?*

A skimmed-milk cheese, of no repute.

§ *What is Cottenham cheese?*

A new-milk cheese of excellent quality.

Where is it made?

At Cottenham and Southam, two villages in Cambridge.

§ *What is cream cheese?*

Cheese made from cream curd.

What is peculiar in this sort of cheese?

It is drained dry, but not pressed.

What places are noted for cream cheese?

Cambridge, Bath in Somerset, York, Aylesbury, and Oxford.

§ *What is Gruyères* (Gru-yair)?

A Swiss cheese.

Why is it so called?

From Gruyères, a decayed village in Switzerland.

(3.—COLOURING MATTERS OF CHEESE.)

Why are some cheeses white and others red?

Because some are coloured and others not.

How are cheeses coloured?

With arnotte, a colouring matter obtained from the arnotto-tree.

What other matters are sometimes used, for

Red-lead, which is poisonous; carrots, saffron, and marigold-flowers.

(4.—PROPERTIES OF CHEESE, AS A FOOD.)

What is the property of cheese, as a food?

It is very nourishing.

What is its worst property?

It is apt to confine the bowels.

How does it act in small quantities?

It assists digestion.

What sort of cheese should be used for this

A ripe old cheese, mouldy and decayed.

How does such a cheese act?

As a leaven or ferment.

By breaking up the crude food which has been eaten.

How is cheese-mould sometimes produced?

By sticking iron or copper nails into the rind.

What is a good way of ripening a cheese?

To place it for a few days under a beer-tub, where the droppings of the tap may fall on it.

What is another excellent plan?

To pour over it a little olive oil.

VEGETABLES FOR FOOD.

Why do cattle grow fat on grass?

Because it contains flesh.

How much flesh does wheaten flour contain?

Ten parts in every 100.

How much flesh does Scotch oatmeal contain?

Eighteen parts in every 100.

What does the Bible say about this?

"All flesh is grass."

What does science show?

That the flesh of our body is wholly due to the flesh of vegetables.

When vegetables are eaten, how is their flesh extracted?

It is mashed by the teeth and dissolved in the stomach.

What then becomes of it?

It enters the blood and becomes part and parcel of our body.

§ *What do vegetables contain besides flesh?*

Starch and sugar.

What use does the stomach make of these

They are converted into fat, or used as fuel to keep the body warm.

What becomes of the grass eaten by a cow?

The *flesh* of the grass makes casein or cheese; while the *starch* forms fat, butter, and milk.

When sheep eat grass, how is it made to serve their uses?

The *flesh* of it becomes mutton, and the *starch* fat or suet.

§ *When man eats beef or mutton, how does his stomach utilise it?*

It appropriates the flesh which the animal extracted from grass.

To what, then, does man owe his flesh?

Only to vegetables, of which oxen and sheep are the collectors.

Why can we not live on grass, like oxen?

Because our teeth are not made to grind it, nor our stomachs to digest it.

DIET.

(1.—WHAT TO EAT.

What is the best way of feeding the body to preserve health?

To diversify our food; take all our meals at uniform times; and eat neither too little nor too much.

Why is sleeping after a meal undesirable?

Because it tends to make us fat, and diminishes vigour.

Which is the worse, fasting or over-feeding?

Long fasting.

Why so?

Because it injures the nervous and vascular system as well as the digestion.

What interval should there be between one meal and another?

Never more than six hours (except during sleep), or four for children.

§ Of what should breakfast consist?

A little animal food, if possible, with tea, coffee, or cocoa.

If persons feel weak and low before breakfast, what should they do?

Drink a draught of fresh pump water on getting out of bed.

What effect would this have?

It would stimulate the digestive organs, and fit them for acting on the food taken at breakfast.

§ When is the proper time for dinner?

As near one o'clock as possible.

What disease does late dining tend to produce?

Paralysis.

Why so?

Because the stimulus of food is too great when the brain and nervous system are excited by long fasting.

If persons dine late, what should they do?

Take a good luncheon, and only a moderate meal at dinner.

When persons feel drowsy after a meal, what may they certainly infer?

That they have eaten too much.

§ *Why is tea a wholesome meal?*

Because it helps to dissolve the food eaten at dinner.

What may persons of weak digestion take, after dinner, instead of tea or coffee?

A cup of warm milk, with a bottle of soda-water poured into it.

§ *To what class of persons is a light early supper desirable?*

To those who dine early and work after dinner, and to literary men who work late at night.

§ *What should be our rule in eating and drinking?*

Never to eat a morsel or drink a drop after the appetite flags, or the stomach feels uneasy.

§ *What caution should be most strictly observed at all meals?*

To bite and masticate our food as much as possible.

What for?

In order to mash it very fine, and mix it well with saliva.

Why must food be bitten fine and mixed with saliva?

That the digestive organs may be able to act upon it.

(2.—HURRIED MEALS.)

If persons are in a great hurry, what food should they eat?

Meat cut very fine indeed, with no vegetables or bread.

Why can meat be bolted without much harm?

Because the digestion of meat is carried on entirely by the secretions of the stomach.

Why cannot vegetables and bread be bolted without injury?

Because they can be digested only when mixed with saliva.

Why do dogs and savage animals eat hastily and voraciously?

Because they feed upon flesh.

Why do cows, horses, and sheep eat slowly?

Because they feed upon vegetables.

Why should men of sedentary habits eat little meat?

Because their secretions are not active, but saliva may be made useful for the digestion of vegetable food.

(3.—PICKLES, AS A FOOD.)

What is the use of pickles in moderation?

They help the stomach to dissolve the fibres of meat.

With what meats are they best used?

With any hard meat, as cold salt beef.

Why are they not eaten generally with cold lamb, fowls, and pork?

Because these foods contain much less fibre than beef and mutton, and do not require the aid of pickle.

(4.—SALADS.)

§ *Why should the yolk of an egg be mixed with salad?*

Because it has the property of making oil mix with water.

How should it be mixed?

It should be well stirred up with the oil first, and the rest of the mixture added afterwards.

What is effected by so doing?

The mixture combines nicely, and does not taste greasy.

§ *Why is oil used with salad?*

To help digestion, and correct the ill effects of the salad.

How does oil help us to digest salad?

In the same way as butter helps us to digest bread, and other substances defective in fat.

What ill effects does oil correct?

The acrid humours of the green food, which irritate the stomach.

(5.—SUGAR AND FRUIT, AS FOOD.)

Why is sugar good for food?

Because it helps to convert food into the elements of our body.

Why should hungry persons eat sugar?

Because it makes less food relieve the craving appetite.

How do puddings and tarts act?

If well made they help digestion.

Who are especially fond of confectionery?

Children, patients from hospitals, and those recovering from long sickness.

Why is this?

Because they require a rapid transformation of food into tissue.

How does confectionery aid this?

By the sugar it contains in an agreeable form.

Why should children be allowed to eat, in moderation, sugar, goodies, and jam?

Because the sugar of these things helps them to extract more nourishment from the food they eat.

Why are thin people, for the most part, more fond of sweets than fat ones?

Because they eat less food, or have a less active digestion.

(6.—DRINKING AT MEALS.)

Should a person drink at meals or not?

He should drink in moderation.

Why is much beer or wine hurtful at meals?

Because it coagulates the albumen of food, and thus disturbs digestion.

Who should always take a little beer or wine at dinner?

Those who are weak, who eat seldom, work hard, or are travelling.

Why should such persons drink beer or wine?

Because it makes a meal support the stomach longer.

What effect would much cold water have?

It would impede digestion by lowering the animal heat.

Why is a little beer more needful for persons who live in large cities than for those who live in the country?

Because their organs are less active, and require an artificial stimulant.

What is the effect of ale or beer in small

It acts simply as a stimulant.

What is its effect in large quantities?

It depresses the system, and excites a craving for more.

HINTS ON COOKING.

(1.—MEAT.)

Why is meat cooked?

To make it easier of digestion.

What loss does meat suffer by being cooked?

Three to four ounces in every pound.

§ *When meat is boiled, should it be put into hot or cold water?*

It should be plunged into boiling hot water, and in a few minutes a little cold should be added.

Why should meat be plunged into boiling hot water?

To "set" its albu´men.

What is the albumen of meat?

A substance, like the white of an egg, stored between its fibres.

What is its effect?

It makes the meat both rich and tender.

If meat is put into cold water, what happens?

It loses its delicious flavour, and eats tough.

Why does it lose its delicious flavour?

Because the albumen and rich juices of the meat ooze out into the water.

Why is the meat hard?

Because the fibres are no longer parted by albumen.

If broth is to be made, what should be done?

The meat should be put into cold water.

Why so?

To make the broth rich and savoury.

§ *When meat is roasted, what plan should be adopted?*

It should be placed at once before a good fire, and then moved a little further off.

Why should it first be placed nearer the fire?

To set the albumen.

Why should cold water be added, and roasting meat be withdrawn from the fire, when its albumen is set?

That the inside may be well cooked, and the surface not too much done.

Why is over-boiled meat tough?

Because the albumen is either extracted by the water, or boiled quite hard.

¶ HINTS FOR COTTAGERS.

§ *How can coarse, refuse meat be made good food?*

Thus: Rub in a little salt and pepper; and simmer it for two or three hours in water, adding a little celery or a few onions.

What should be done with the fat that rises to the surface?

It should be skimmed off and saved for puddings.

To whom would such a stew be of very great service?

To those who live chiefly on bread or potatoes.

§ *How could bones be made equally serviceable?*

Thus: Break the bones small; and boil them for three or four hours, with a little salt and a few herbs.

What is next to be done?

Skim off the fat and remove the bones, but save the water.

What is to be done with the fat skimmed off?

Put it back into the clean saucepan, and add two sliced onions, som carrots, turnips, or celery, and a little raw sugar.

How is the soup to be finished off?

Set the saucepan on the fire till the fat is melted; then add a handful o oatmeal and rice, pour back the water, and boil till the rice is soft.

NOTE.—*These hints are given that those in the upper conditions of lif may be able to advise their humbler neighbours, and those in humbl life may know how to furnish meals far cheaper and better tha bread or potatoes.*

(2.—POTATOES.)

Which is the more nutritious, potatoes bread?

Bread is twice as nutritious as potatoes.

How should new potatoes be cooked?

New and all waxy potatoes should be put into hot water and cooked quickly.

How should old potatoes be cooked?

They should be put into cold water, and cooked more slowly.

What should be added in both cases?

A little salt.

If potatoes are watery, what will greatly improve them?

A little piece of lime, about as big as a hazel-nut, added to the water.

What effect will this produce?

e lime will extract from the potatoes some of the substances which make them watery and waxy.

(3.—OTHER VEGETABLES.)

Why should a little salt be added to the water in which vegetables are boiled?

To make them taste brighter and better.

What effect has the salt?

It prevents the flavouring matter from escaping into the water.

What vegetable is spoilt if boiled in water without salt?

Onions, which lose both their taste and odour when boiled without salt.

Why are the poor especially fond of onions, cabbages, and cauliflowers?

Because they have very little meat to eat, and these vegetables are especially rich in flesh-making stuff.

How can a very nutritious and excellent food be made of boiled cabbage and potatoes?

Thus: Beat them together with a little lard or pork fat, add salt and pepper, and serve up warm.

§ *What herb greatly improves green peas?*

A few leaves of sorrel boiled with them will improve both their colour and flavour.

(4.—TO MAKE JAMS.)

When should jams be made?

When fruit is first fully red, and before it is too ripe.

Why so?

Because this early fruit contains hardly any sugar, but a very large quantity of vegetable jelly.

How is it with very ripe fruit?

It contains ten or twelve times more sugar, and less jelly.

Why so?

Because the gummy materials have been converted into sugar.

Which will make the firmer jam?

The fully red fruit, because it contains more gum or jelly.

How will jam made late in the season behave?

It will candy, ferment, and turn mothery.

Why so?

Because there is too little gum.

What should be added to such jams to make them keep better?

A little isinglass or gum arabic.

§ *What is the best way of keeping out the air?*

To cover the jam-pots with paper moistened with the white of eggs.

What harm would the air do?

It would cause the jams to become mouldy.

What is the mould of jams?

Very small plants of the fungus kind, which grow on the surface of the jam.

PART III.

REFUSE AND WASTE,

AND

THINGS DESPISED.

REFUSE AND WASTE.

(1.—BONES.)

§ *What are refuse bones from butchers' shops, &c., used for?*

Some are made into buttons, paper-knives, handles, combs, rings, and other useful articles.

What is done with the shavings, scrapings, and saw-dust of these articles?

Some are used for converting iron into steel, and some are boiled down for size, glue, and jelly.

What is done with the refuse of the size, glue, and jelly?

It is used for making lucifer matches.

§ *What is done with the bones rejected by the cutler and bone turner ?*

They are boiled down for their fat.

What is done with their fat?

It is made into soap and candles.

What is done with the refuse bones, after the soap and candle makers can make no further use of them ?

They are burnt and made into bone or animal charcoal.

What is animal charcoal used for ?

Filtering water and refining sugar.

What is done with the charcoal when the refiner can make no further use of it ?

It can be used for refining metal, or for manure.

(*See* pp. 46 to 49.)

(2.—ANIMAL OFFAL.)

¶ *What use is made of the chips and parings of the* TANNERS *and* LEATHER-DRESSERS ?

The fleshy and oily parts are sold to soap and candle makers.

What is done with the rest?

It is made into glue.

What is the best glue made of?

The parings of hides and skins.

What is the second quality made of?

The refuse of tan-yards, such as the ears of oxen, sheep, and calves.

What is the commonest sort made of?

The coarsest offal of slaughter-houses.

§ *What is done with the better sort of animal offal, such as sinews and tendons?*

They are boiled down into gelatine.

What is the gelatine used for?

Jelly and isinglass, artificial flowers, and sweetmeat wrappers.

¶ *What use is made of the* CURRIERS' *odds and ends?*

Some are used by shoe-makers, some are made into Prussian blue, and some into a tough sort of paper.

What use does the shoe-maker put them to?

He fills up with them the soles of boots and shoes.

¶ *What is the chief refuse of* SOAP-BOILERS?

Glycerine.

What is done with this refuse?

Some is made into glycerine soap, some is used by perfumers, and some for cod-liver oil.

§ *What else is done with soap-makers' waste?*

It is used in the manufacture of common glass.

§ *What is done with broken bottles, and the waste of glaziers and glass-makers?*

The broken glass is melted down, and made into wine and beer bottles.

¶ *What is done with* KITCHEN STUFF?

Some is used to make pie-crust, but the larger part is made into soap, candles, and cart grease.

¶ *What is the offal of* FISH *good for?*

To make into isinglass.

From what is the best isinglass made?

The skin, intestines, and air-bladders of the sturgeon and other large fish.

What is isinglass used for?

Cookery, sticking plaster, to stiffen silk, and some other purposes.

What is the refuse, unfit for any of these purposes, good for?

It makes most excellent manure.

(4.—REFUSE WOOLLEN, COTTON, AND SILK.)

¶ *What is done with the wool wasted in the process of spinning?*

Some is mixed with fresh wool, and made into cloth.

What is done with the rest?

It is carefully collected, reeled, and worked up into inferior cloths.

What is done with the fluff, or flock, too short to be reeled?

It is used for stuffing flock beds, and for decorating flock paper.

What is done with the selvage and list of cloth?

It is torn to pieces, and re-wound to be woven into cloth

§ *What is done with old woollen rags, and bits of carpet too far gone for the second-hand shops?*

They are torn to pieces by machinery, and made into wool again.

What is this second-hand wool called?

Shoddy.

What is done with this shoddy?

It is made into inferior cloth, such as pilot coats, padding, drugget, and cheap carpeting.

Where is the chief seat of the shoddy manufactures?

At Dewsbury, in Yorkshire.

Where else is the trade carried on?

At Leeds, Wakefield, and other large woollen towns.

What is done with the refuse which cannot be worked up?

It makes most excellent manure.

§ *What is done with the soap-suds in which shoddy and cloth is washed?*

Some is made into soap again, and some is sold for manure.

When made into soap, what is done?

Sulphuric acid is poured into the greasy water.

What effect does this produce?

The fatty matters are separated, float on the top, and are skimmed off.

What is done with these skimmings?

They are made into soap in the usual way.

¶ *What is done with the cotton and silk wasted in the process of manufacture?*

It is all collected, reeled, and worked up into inferior cotton or silk goods.

What is done with the odds and ends unfit for weaving?

They are made into paper.

(5.—SWEEPINGS.)

What can be done with the sweepings of woollen factories and slaughter-houses?

They can be used for making dyes, paints, and prussic acid.

How must they be treated?

Mixed with bits of iron and wood-ashes, they are heated red hot in an iron vessel.

What does this mixture make?

Ferro-cyanides (*cy΄-a-nides*).

What are they?

Iron-blues.

What blues are made of this mixture?

Every possible shade, from Prussian blue to milk-and-water colour.

What other colours are made from the same mineral substance?

Ruddy brown and white.

How is a ruddy brown made from this mineral substance?

By adding the sulphate of copper.

What must be added to make a white?

Acetate of lead.

By whom are these dyes very largely us

By calico printers.

§ *How can the same mineral substan converted into prussic acid?*

By the addition of sulphuric acid.

(6.—OTHER REFUSE.)

¶ *What are fruit lozenges made of?*

Benzoic acid.

How is benzoic acid made?

It can be made from the drainings of stables and cow-houses.

What is used to give "nectar" its pleasant smell and taste?

Benzoic acid.

¶ *What use can be made of port-wine dregs?*

They can be used for making seidlitz powders.

Why is this very strange?

Because the dregs of that very wine which intoxicates a man sobers him again.

¶ *What use can be made of old nails, hoops, and other refuse iron?*

They can all be melted down, and made into new iron.

What strange conversions may be thus made?

An old sword may become a ploughshare; an old gun-barrel, a pruning hook; and an old anchor, dragged from the sea, part of a lady's dress.

¶ *What use can be made of the refuse tar of our coal gas?*

It can be made into the essential oil of almonds, and other essences.

What else can it be made into?

A beautiful dye, as mauve and magenta.

¶ *What is done with house-sweepings and refuse cinder-dirt?*

It is collected by dustmen.

What use is made of the dustman's load?

It is carefully sifted, and the fine dust used for making bricks.

What is done with the rest?

It is packed in large tubs, and sold for manure.

¶ *What use can be made of chaff and sawdust?*

It can be made into formic acid, by distillation.

What must first be added to it?

An oxide of manganese, sulphuric acid, and water.

What use can be made of formic acid?

It can be made into chloroform.

USE OF A DEAD HORSE.

What is the use of a dead horse?

Every part is useful, and may be sold.

What can be done with his skin?

It can be made into leather, for shoes and other purposes.

What can be done with the odds and ends cut off the skin as refuse?

They may be boiled down for jelly, size, and glue.

What use can be made of the hair scraped off the skin?

It can be used in mortar, plaster, and stucco.

What use can be made of the mane and tail?

It can be made into plumes, woven into hair-cloth, or used for stuffing chairs and sofas.

What can be done with the tendons?

They can be mixed with the clippings of the skin, and made into glue.

What can be done with the flesh?

It can be sold for dogs' and cats' meat.

What can be done with its tongue?

It can be dried for rein-deer's tongue, or dressed for ox-tongue.

What can be done with the blood?

Some of it can be used for blue paint, and the rest for manure.

What can be done with the intestines?

They can be stuffed with sausage-meat, or used to hold lard.

What can be done with the bones?

Some may be used for knife-handles.

What can the rest be used for?

Lucifer matches and bone-dust.

What can be done with the hoofs?

Some can be mixed with the blood, and made into blue paint, and some may be made into snuff-boxes.

What can be done with the shoes?

They can be melted into new iron.

USE OF A DEAD DOG.

What use can be made of a dead dog?

It can be used for a multitude of useful or luxurious purposes.

§ *Name one?*

A part of it may be put into a lady's smelling-bottle.

Under what form?

Either as a delicious perfume, or as smelling-salts.

How can it be converted into a perfume?

Glycerine is largely used by perfumers for their choicest perfumes.

How is glycerine obtained from a dead dog?

By mixing soda with the boilings of the fat and bones.

What does this produce?

A sweet substance, called glycerine, or the sugar of fat.

How can the putrefying flesh of a dead dog be converted into smelling-salts?

Merely by adding to it a little hydrochloric acid.

§ *What further use can be made of a dead dog?*

You can wash your face and hands with a part of it.

How so?

Part of the glycerine may be used for scenting soap, or made into glycerine soap.

§ *What other use can a dead dog be put to?*

A lady going to court may put a little on her cheeks or lips, to improve their hue.

How can this be managed?

Part of the glycerine may be mixed with carmine, and sold for lip-salve, or a delicate tint for the cheeks.

§ *Name another use which can be made of a dead dog.*

It may be brought to table as a delicacy, and eaten with much relish.

How can this be done?

From the skin, tendons, and bones, gelatine can be obtained; and this gelatine may be made into jelly.

§ *What other delicacy can be made of it?*

A part can be put into our tea or coffee, tarts or puddings.

How can this be done?

Sugar may be refined by being strained through its burnt bones.

§ *What else can be done with a dead dog?*

A gentleman can appear in a part of it at a ball or on Rotten Row.

How so?

Part of the skin may be made into boots, and part into riding gloves.

¶ *What order was made in Paris about dogs some few years ago?*

That all dogs without an owner should be shot, and thrown into the Seine.

How many dogs were so destroyed?

Several thousands.

Who found out that these dead dogs could be turned into money?

The refuse-pickers (*chiffonniers*).

What did they do with them?

They got them out of the river, skinned them, and boiled them down.

What was done with the skins?

They were made into kid gloves.

What was done with the boilings?

They were made into soap and candles.

USES TO MAN OF THINGS DESPISED.

(1. INSECTS.)

INSECTS USED FOR MAN'S FOOD.

¶ *What insects might the Jews eat ?*

Locusts, beetles, and grasshoppers (Lev. xi. 22).

What food did the Baptist eat ?

Locusts and wild honey.

How were they eaten ?

The locusts were dried, made into thin cakes, and sweetened with honey.

What people still eat grasshoppers and locusts ?

The Arabs and Moors, Persians and Syrians, Hottentots and Kaffirs.

How do the Arabs dress them ?

They first boil them, and then stew with butter.

How do the Moors dress them ?

They first boil them, and then fry with pepper, salt, and vinegar.

§ *What people make beetle wine?*
The Mexican Indians.

How do they prepare it?
They macerate beetles in water spirit, and drink the liquor as stimulant.

What is the beetle sometimes called in the O Testament?
The *canker-worm* and *caterpillar*.

What people still eat caterpillars?
The Bushmen of Africa, and the Ne Hollanders.

§ *What people, besides the ancient Jews, used to eat grasshoppers?*
The ancient Greeks and Parthians, who thought them a great dainty.

Who still eat the grub of this insect?
The American Indians and natives of New South Wales.

¶ *What insect is thought a great dainty in both the Indies?*
The grub of the palm-weevil.

What do travellers tell of this food?

That it makes a most delicious food roasted.

§ *What people eat silk-worms.*

The Chinese, after they have stripped them of their silk.

§ *What people eat ants and spiders?*

Many African tribes.

How do the Hottentots eat ants?

Both boiled and raw.

§ *What people eat bees?*

The people of Ceylon.

Where is Ceylon?

It is a large island south of Hindustan.

INSECTS USEFUL IN MEDICINE.

¶ *What insects are useful in medicine?*

The Spanish-fly, beetles, and ants.

§ *For what is the Spanish-fly useful?*

Chiefly for blister-powders and hair-stimulants.

With what insect is it sometimes adulterated?

The golden beetle, especially in Germany.

§ *What indirect use are beetles in medicine?*

By their aid we obtain the gum called ammoniac.

How so?

The gum oozes, in summer, from the punctures made by these beetles.

Where do the plants grow?

The best in Persia, but some in India and Morocco.

§ *What medicines are made of ants?*

Formic acid and chloroform.

What is the meaning of formic acid?

Ant acid, from *formica*, the Latin for "ant."

What is the use of chloroform?

To produce insensibility when painful operations are to be performed.

INSECTS USED IN THE ARTS.

DYES.

¶ *Of what uses are insects in the arts?*

They afford us dyes, lac, wax, honey, and silk.

§ *What insect gives us nut-gall?*

A fly called "cynips" or gall-fly.

What are nut-galls used for?
Ink, black dye, and medicine.

What is nut-gall?
A wart in the leaves and tender shoots of a species of oak.

How is this wart produced?
By the eggs of the gall-fly.

Where do most of our nut-galls come from?
Aleppo, Smyrna, and other parts of the Levant.

Where else are they common?
In Tripoli (North Africa), and the East Indies.

Which galls are most esteemed?
Those called *blue* galls.

Which are they?
The first gathering, before the fly has eaten its way out of the leaf.

What are the other nuts
White galls.

Why are they inferior to the blue galls
Because they are less astringent.

§ *What other dyes do insects afford?*
Vermillion, scarlet, and lake.

What insects afford these dyes?
Several species of the *coccus* insect.

What does the word "vermillion" come from?
The Latin word *verm-es*, a worm.

Why is this crimson called "worm-colour?"
Because it is obtained from a little worm of the coccus family.

In what parts of Europe does this little worm abound?
In Spain and the south of France.

In what parts of Asia is it common?
Persia, Arabia, and the East Indies.

What did the Phœnicians call this dye?
Tola.

What did the ancient Greeks call it?
Coccus.

What do the Persians and Arabians call it?
Kerm-es.

What English word comes from kermes?
Crimson, a corruption of *kerm-ĭ-zon*.

§ *What insect is now employed for all sorts of scarlet dyes?*

The cochineal.

What is the cochineal insect?

A species of coccus, which feeds on the cactus plant.

What is this insect called?

The cactus-coccus (*coccus-cacti*).

Where do we obtain it from?

Mexico and the West Indies.

What is the annual value of this export to the Mexicans?

At least half-a-million sterling.

How does it look when we receive it?

Like a reddish shrivelled grain, covered with a white powder or bloom.

LAC.

¶ *What is lac?*

The produce of a kind of ant, one of the coccus species.

Where is it collected?

From various trees in India, where it is very common.

What are the different qualities of lac callec

Stick, seed, lump, and *shell.*

§ *What is* stick *lac?*

The twigs with the insect still sticking to them.

What is done with these sticks?

They are laid in hot water to melt the resin from them.

What becomes of the resin?

It floats on the top, and is skimmed off.

What is then done with it?

It is melted round sticks, as tallow on a wick.

What are the drops which fall from the sticks called?

Button lac.

What is done with button lac?

It is collected and melted again.

§ *What is done with the water in which the sticks were laid?*

It is carefully strained and evaporated.

What is done with the sediment?

It is made into small cakes, and sold for dye.

What are these cakes called?

Lac-dye.

What other dye is made from lac?

A dye called lac-lake.

§ *What is* seed *lac?*

The sticks after they have been laid in hot water.

What use are these sticks?

The lac which still clings to them can be used for inferior purposes.

§ *What is* lump *lac?*

The lac made into lumps or cakes.

What is shell-*lac?*

The lac strained and formed into thin flakes.

¶ *What is lac used for?*

Varnish, japanning, sealing-wax, and dye.

§ *What is lacquer?*

Shell-lac dissolved in alcohol, and coloured.

What is yellow lacquer used for?

To lacquer brass, that the air may not tarnish it.

§ *What is "French polish?"*

Shell-lac dissolved in alcohol, and mixed with oil.

§ *What is sealing-wax?*

A mixture of shell-lac, Venice turpentine, and some colouring matter.

What is the Venice turpentine for?

To soften the lac, which would be otherwise too brittle.

What colouring matter is used?

Ivory black for black sealing-wax, and cinnabar or vermillion for red.

WAX AND HONEY.

¶ *What is wax?*

A substance produced by bees.

What use do they make of it?

They construct their cells with it.

How do they manufacture it?

By mixing honey with a sort of saliva which nature supplies them with.

Where do they deposit it when made?

In their wax-pockets.

Where are their wax-pockets?

In the little rings which run round their body.

How do they contrive to deposit it there?

By some muscular action they make it ooze out of their second stomach into these pockets.

What is the first stomach of the bee used for?

The reception of their honey-food.

§ *How are the hive-cells completed?*

The chinks and cracks are filled up with a sort of gum.

What is this gum called?

Pro-polis.

Whence is it obtained?

From the leaf-buds of certain trees.

What trees supply this gum?

The poplar, birch, and willow.

§ *What is the native colour of wax?*

Yellow. It is bleached white by the art of man.

What is white wax used for?

Candles, ointments, and cerates.

What else is it used for?

Artificial fruits and flowers, busts, and models.

¶ *What is honey?*

A sweet syrup collected by bees from flowers.

Where do they keep it for use?

In their little pantries or cells.

How do they extract it from the flower?

By their trunk or proboscis.

How do they carry it home?

In their crop or honey-bag.

When they get home, what do they do with it?

They disgorge it into the hive-cells.

What use do they make of it?

It is their food on which they live.

§ *What honey is often praised by classic poets?*

That from Hybla and Hymettus.

Where is Hybla?

It is a mountain in Sicily.

Where is Hymettus?

It is a mountain in that part of Greece called Attica.

Why was the honey of these mountains so celebrated?

From the wild thyme and other fragrant herbs which grew there.

§ *What honey is now greatly esteemed?*

That of Narbonne in France, and Chamouni in Savoy.

What colour is the best honey?

A clear, golden straw-colour.

What colour is old honey?

Yellow; sometimes so dark as to look a reddish brown.

What is honey used for?

Chiefly in medicine, and as a table delicacy.

When was its value greater than it is now?

Before the use of sugar was so general.

What honey is used only for a delicacy?

Greek honey, which is very fine.

What is the best new honey called?

Virgin honey.

§ *What is rock-honey, so often spoken of in the Bible?*

The honey of wild bees, as clear as water, and very thin.

Why is it called rock *honey*

Because the cells are hung on rocks in a cluster, like a bunch of grapes.

Who made rock-honey his daily food?

John the Baptist..

BOTANICAL USES OF INSECTS.

¶ *In the centre of a flower are several little threads: what are they called?*

The pistils and stamens.

§ *Which are the pistils?*

The central thread or threads, furnished at the end with a little mouth

What is this little mouth called?

The stigma or summit.

What is found at the bottom of the pistil?

A number of little seeds or eggs.

§ *What are the stamens?*

Little stalks ranged round the pistil like satellites.

---

[*] In some flowers there are two or more of these central threads, called *styles*, each of which has its mouth or *stigma*: and in some flowers, as the tulip and poppy, the pistils have *no stalk or style*, but only the stigma or mouth.

How may they be known?

Each one has a little knob at the end, full of dust called pollen.

What is the little knob called?

The anther or tip.

¶ *When a flower has both pistils and stamens, what is it called?*

A perfect flower.

If it has only pistils *and no stamens, what is it called?*

A female flower.

If it has only stamens, *what is it called?*

A male flower.

What is the difference between a male and female flower?

A male flower has the *pollen*, and a female flower the *mouth* to receive it.

¶ *What must be done before a flower can have fruitful seed?*

The pollen must drop into the mouth of the pistil.

In perfect flowers, how is this done?

By the wind shaking the flower, or some contrivance equally simple.

In flowers of only one sex, what must be done?

The pollen of the male flower must be *carried* to the mouth of the female.

How is this managed?

By insects, or some marvellous arrangement equally striking.

EXAMPLES.

§ *How is an iris-flower made fertile?*

A humble-bee pushes into it, and, brushing against the pollen, carries it about till it touches the pistil.

What other plants do humble-bees fertilise?

Red clover and heart's-ease.

Where do all these plants flourish best?

Near towns and villages where humble-bees are most numerous.

Why are they most numerous in such places?

Because cats and owls keep down the field-mice.

What harm do field-mice to humble-bees?

They destroy their combs and nests.

What for?

For the sake of the honey, of which they are very fond.

§ *How is the barberry impregnated?*

Some insect gets into the flower and touches the pollen-stalk.

What follows?

In a moment the stalk bounds back and knocks against the pistil, which swallows the pollen with open mouth.

How could you or I do this?

By touching the little stalk with a pin.

§ *What other plants are similarly fertilised?*

Toad-flax, birth-wort, certain nettles, melons, cucumbers, orchids, &c.

How is birth-wort propagated?

A gnat gets entrapped in the flower, and in its effort to escape, shakes the pollen on the anther.

How does it then escape?

The hairs of the flower fold back and release their prisoner.

§ *How are cucumbers and melons "set?"*

By bees, which convey the pollen from the male to the female flower.

What would otherwise be the result?

The flowers would never turn into cucumbers and melons.

How is this sometimes done by gardeners?

They carry the pollen to the female flower, and put it on the stigma.

§ *What* trees *are fertilised by insects?*

Willows, firs, and poplars.

What is the "sexual" nature of these plants?

Some are male and some female.

What must take place in such plants?

The pollen of the male flower must be carried to the female.

In willows, firs, and poplars, how is this done?

By insects which visit the male-flowers first, and then the female while their bodies are dusty with pollen.

¶ *What plants catch insects?*

Fly-traps, oleanders, rhodo-dendrons, kalmias, and some balsams.

What use are they to the plant?

They die and manure its leaves.

INSECT SCAVENGERS.

¶ *What is the main office of insects?*

They are Nature's chief scavengers.

What filth do they remove?

All sorts of excrements, dead carcases, and rotting vegetables.

What harm would these things do if they were not removed?

They would disgust the eye, offend the nose, and injure health.

¶ *What excrements do insects clear away?*

Those of beasts, birds, and reptiles.

What insects are especially useful in removing these impurities?

Flies and beetles.

What is very marvellous in the way they perform this office?

Though they feed on the filth, and burrow in it, yet are their bodies never soiled by it.

¶ *What insects feed on dead carcases?*

Flesh-flies, beetles, and ants.

How do flesh-flies remove animal matter?

They not only feed on it, but also deposit their eggs in it.

§ *What does Linnæus say of the flesh-fly?*

That three will devour a dead horse a soon as a lion.

How does he make that out?

Three flesh-flies will lay 60,000 eggs, all of which in five days will be full-grown flies.

§ *Where are beetles abundant?*

In London, and the houses of other large cities.

What service do they perform?

They eat up dead and living insects, waste animal matter, and the excrements of house vermin.

Where are they never seen?

Where there is no work for them to do.

§ *Where are ants most abundant?*

In hot countries.

What service do they render the natives?

They enter their houses occasionally in vast armies, and remove all defilements in a few hours.

What do they clear off?

Rats and mice, cockroaches and beetles, caterpillars and centipedes, whether dead or alive.

§ *How can one obtain the skeleton of a bird, frog, or other small creature?*

Thus: Flay it, rub it over with honey, and then place it on an ant-hill.

What will be the result?

The bones will be picked clean, and the skeleton left perfect.

¶ *What insects feed on rotting vegetables?*

Flies, gnats, locusts, and caterpillars.

What special service do gnats *perform?*

They keep stagnant water from putrefying and polluting the air.

In what way?

Their young ones feed on the mantling filth, and purify the waters.

§ *What special service do* locusts *perform?*

They clear regions choked with rank vegetation, that it may bear wholesome grasses instead.

INSECTS AS COUNTERCHECKS.

What further service are insects to man?

Many help to keep in check the increase of their own tribes.

What large insects feed on their fellows?

Dragon-flies, spiders, beetles, hornets, and wasps.

What small insects do the same?

Lady-birds, ear-wigs, ants, and several of the bug family.

What feed on the eggs and grubs of insects?

Ichneumon-flies and gnats.

§ *What are the fiercest of the insect tribe?*

Dragon-flies.

What insects do they devour?

All sorts, and in every stage of existence.

§ *What insects feed on flies?*

Spiders, hornets, and wasps.

§ *What insects do* sand-wasps *devour?*

Caterpillars, spiders, grasshoppers, and cockroaches.

§ *What insect do* lady-birds *devour?*
The hop-fly (*a-phis*).

To whom, then, are they especially useful?
To hop-growers, who would otherwise often lose their entire crop.

§ *What insects do* ear-wigs *feed on?*
The lice which infest roses, pinks, dahlias, and other garden flowers.

What fruit-trees suffer from the plant-lice?
Apple-trees, which they much infest.

How do they injure these trees?
They eat the sap, cause great wens, and, in time, kill the trees.

How may their presence be detected?
By a substance like spittle on the tree.

What vegetables suffer from the same insects?
Turnips, cabbages, beans, and potatoes.

What forest-trees do they visit?
Lime-trees, the leaves of which they cover with honey-dew.

What is honey-dew?
The excrement of plant-lice.

When are ear-wigs and lady-birds most abundant?

When plant-lice are most numerous.

If it were not for these insects, what evil would happen?

Many of our trees, vegetables, and flowers would be utterly destroyed.

§ *What insects do* water-bugs *devour?*

Water insects.

What are the great scavengers of our ponds and ditches?

Water-bugs and gnats.

¶ *What service does the ichneumon-fly perform for us?*

It feeds on the eggs of insects deposited in cabbages and wheat.

What harm would these eggs do if suffered to remain?

They would turn into insects, and destroy the plants in a few days.

¶ *What insects devour each other?*

Spiders, caterpillars, scorpions, and many others.

INSECTS THE FOOD OF OTHERS.

What other animals feed on insects?

Fishes, birds, reptiles, and some quadrupeds.

¶ *What* quadrupeds *feed wholly or in part on insects?*

Moles and hedgehogs, pigs and cats, squirrels and badgers, foxes and monkeys, bears and ant-eaters, &c.

§ *What insects do* moles *devour?*

Wire-worms, the greatest pests to farmers of all the insect tribe.

What else do moles devour?

Young grubs, worms, and insects, under the soil.

What further use are moles to man?

They help to underdrain the land, and improve it by turning up the subsoil.

§ *What do* hedge-hogs *eat?*

Insects, snails, and small birds.

What service will they perform in a house?

They will soon clear it of black-beetles, crickets, and cockroaches.

§ *Of what insects are swine fond?*

Cockchafers' grubs, in search of which they will root up acres of land.

What else do they eat with great relish?

Snails and slugs.

§ *What insects do cats eat?*

Beetles and flies.

§ *What insects are squirrels fond of?*

Locusts.

§ *What insects do badgers feed on?*

Beetles, which are also eaten by foxes.

What insects do ant-eaters devour?

Ants, which are also eaten by bears.

¶ *What reptiles feed on insects?*

Tortoises and lizards, frogs, toads, and snakes.

§ *What do* toads *eat?*

Worms, grubs, slugs, ants, and other things harmful to vegetation.

¶ *What* fish *feed on insects?*

Salmon, carp, and a host of others.

What do small fish feed on?

Water-plants and insects invisible to the eye of man.

¶ *What* birds *feed on insects?*

All song-birds, and if we had no insects we should have no song-birds.

§ *What insects does the kestrel feed on?*

Grasshoppers and beetles.

§ *What insects do pies feed on?*

Locusts, a favourite food of thrushes.

§ *What insects do rooks devour?*

All sorts of insects.

Why do they follow the plough?

To look for grubs from the freshly turned-up soil.

§ *What does the wryneck live on?*

The insects and eggs of decayed wood.

What else does it devour?

Ants; a favourite food of young partridges also.

§ *What birds are fond of cockchafers?*

Poultry, especially ducks and turkeys.

Why should poultry be kept in cattle-yards?

To peck from the legs of cattle the flies which greatly annoy them.

What insect is especially annoying to cattle?

The gad-fly.

Why so?

Because it lays its eggs on some part which the cattle can lick.

What for?

That the cattle may swallow them, and hatch them in its warm stomach.

Why do cows and oxen stand sometimes for hours in a pond?

To prevent the gad-fly from laying its eggs on their legs.

What service will poultry render them?

They will pick off the flies and eat them.

§ *What insects do swallows live on?*

Almost all sorts of insects.

Why do they fly high in fine weather?

Because insects, which they seek for food, fly high.

When they fly low, why do we look for rain?

Because it is the lowering clouds which drive the insects downward.

§ *Of what insects are sparrows fond?*

Caterpillars and butterflies, but they eat other insects also.

RECAPITULATION.

(1.—USE OF INSECTS.)

¶ *What* direct *use are insects to man?*

They fertilise certain plants, and afford him food and medicines, dyes, lac, silk, and wax.

What indirect *use are they?*

They clear the earth of defilement, and are the food of several animals.

§ *What insects are the chief land scavengers?*

Beetles, flies, and ants.

What are the chief water scavengers?

Water-bugs and gnats.

What insects feed on animal matter?

Flesh-flies, beetles, and ants.

What feed on rotting vegetables?

Flies, gnats, locusts, and caterpillars.

§ *What special use to man is the lady-bird?*

It clears hop-grounds of the "fly."

§ *What special use is the ear-wig?*

It clears trees and flowers of lice.

§ *Where is the ichneumon-fly useful?*

In the clover and turnip field.

Why so?

Because they feed on weevils and "Black Jacks."

Where do weevils lie concealed in clover?

In the seed-vessels, where they feed upon the seed.

Where do Black-Jacks *lie hid in turnips?*

In the young seed-sprouts.

What great harm do they commit?

They sometimes eat these leaves, and then the turnips die.

How is the crop preserved?

By the ichneumon-fly, which attacks them and saves the plant.

§ *What use to man are fleas and bugs?*

They compel him to cleanliness.

Why so?

Because in no other way can they be warded off.

Why should pigeons never be kept near a dwelling?

Because they swarm with bed-bugs, and their young with infant fleas.

(2.—USE OF BIRDS.)

¶ *Of what use to man are small birds?*

They destroy the insects, grubs, and worms, which would otherwise ruin our corn and fruits.

How many eggs will an insect lay in a year?

Some as many as 2,000.

How many will a tom-tit eat in a year?

As many as 200,000.

How many insects will a swallow eat?

Between 600 and 700 a-day.

How often will a black-bird feed its young?

Above 100 times a-day, and chiefly on caterpillars.

How often will a thrush feed its young?

Above 200 times a-day.

How often will a tit-mouse feed its young?

Above 400 times a-day.

How many caterpillars will a sparrow and her brood devour in a week?

Between 3,000 and 4,000.

What use are owls?

They feed by night on snails, large insects, and field-mice.

What bird feeds by day on similar foods?
The kestrel.

To whom are these birds very serviceable?
To the farmer, who would suffer greatly in his harvest without them.

What use are bats?
They feed upon insects, and help to keep them in check.

§ *What is the use of woodpeckers?*
They feed on eggs and insects.

Where do they search for food?
In decayed wood and the bark of trees.

§ *What use are carrion birds to man?*
They feed upon worms and large insects, as well as upon animal offal.

¶ *What use to man are birds of prey?*
Some live on small birds, so as to prevent their too rapid increase.

What do others live on?
Some on rats, mice, and other vermin.

What do others live on?
Offal, and thus prevent infection.

THE LESSON TAUGHT US.

¶ *What does our knowledge of the habits of birds and insects teach us?*

That God preserves a proper balance, which man cannot alter without doing more harm than good.

What would happen if we were to destroy all the small insects?

Earwigs, and other insects which live on them, would be starved to death.

What would happen if all ear-wigs and other medium-sized insects were destroyed?

The small birds would die, and our trees, flowers, and corn be eaten up.

What would happen if we killed the large insects?

Smaller ones would be our plague, and many creatures would be starved.

§ *What would happen if we killed our small* birds?

Insects would devour the whole vegetable world.

What would happen if we killed our larger birds?

Small ones and vermin would multiply to our plague.

§ *What would happen if there were less variety of food?*

The struggle for food would lead to constant strife, and the peace of the world would be destroyed.

§ *Why do most insects sleep all winter?*

Because there is then no work for them to do.

Why is there no work for them in winter?

Because putrefaction is less common, and its effluvia less dangerous.

When do they wake from their long sleep?

When the sun is warm, and corruption would peril the life of man.

THE MISCHIEF OF IGNORANCE.

What great mischief may occur from ignorance of these facts?

Persons may destroy the very creatures that are their greatest friends.

§ *Give an example.*

A hop-grower may see swarms of lady-birds in his grounds, and fancy he has found out his enemy.

What mischief might he do ?

He might use all his efforts to destroy these insects, without knowing they are his best friends.

§ *Give another example.*

A farmer may observe a host of flies about his fields, and fancy they are the cause of the turnip disease.

What is the fact ?

The Black-Jacks do the mischief, and the flies are there to eat them.

§ *Give a third example.*

A gentleman may observe the woodpecker and wryneck at his trees, and fancy they are doing harm.

Acting on this notion, what may he do ?

Order his gamekeeper to shoot them.

What evil would this be doing ?

He would destroy his best friends.

How so ?

The birds are there to clear his trees of insects.

§ *Give a fourth example.*

A gardener may see his dahlias and roses sicken, and blame the earwigs.

Under this notion, what may he do?

Set traps to destroy them.

What is the real fact?

It is the plant-lice which are doing the mischief, and the ear-wigs are there to devour them.

§ *Give a fifth example.*

A farmer may observe that his land is over-run with moles, and order the mole-catcher to extirpate them.

What would be the probable result?

Next year his corn would sicken, his turnips die, and his crops fail.

Why so?

Because wire-worms would multiply, and attack their roots.

§ *Give a sixth example.*

The people of South Carolina, by destroying the woodpeckers, lost once almost all their trees.

How did they lose their trees?

By the ravages of insects, especially of a black-winged bug, on which the woodpeckers fed.

Why did they kill the woodpeckers?

Because, in searching for insects, they sometimes picked the apples and destroyed them.

§ *Give a seventh example.*

The people of New York ordered all crows (called grackle) to be shot.

Why did they order these birds to be shot?

Because they sometimes pulled up the young maize to look for grubs.

What was the result?

Insects increased to such an extent, that no grass came to maturity.

What were the people obliged to do?

Send to England for hay, to save their stock from death.

What law did they then make?

They made it penal to destroy a crow.

§ *Give an eighth example.*

The French made war upon the birds, because they pecked their grapes.

How did they make war upon them?

They offered rewards to those who destroyed the most.

What was the consequence ?

Their corn, vines, olives, and even forest trees were almost ruined.

By what means ?

By the insects, which multiplied to a most fearful extent.

What advice has now been given to the French Government ?

It has been urged to prohibit by law the killing of small birds.

(3.—USE OF WORMS, SLUGS, AND SNAILS.)

§ *What use to men are worms ?*

They stir and loosen the soil, making it more fertile.

How else do they fertilise the soil ?

By leaving on its surface what are called worm-casts.

What are these worm-casts ?

The "voidings" of the worms, and the very best soil possible.

What do we owe to these worm-casts ?

The high value of our best old pastures.

What further use are worms ?

They are food for birds, fish, moles, and other animals.

§ *What use are slugs and snails?*

They feed on dead animals, excrements, and vegetable nuisances.

(4.—USE OF VERMIN.)

§ *What is the value of a weasel to a farmer?*

Every weasel is worth to him an annual sack of corn.

Why is this?

Because they prey on rats, which would multiply to a frightful extent, if not fed upon by other animals.

Why do farmers kill weasels as vermin?

Because they occasionally eat a young duck or chicken.

§ *What use to the farmer are stoats and polecats?*

They also feed on rats and mice.

§ *What use to man are rats?*

They devour all kinds of garbage, and save us from many a disease.

Where are they most numerous?

In the sewers and bins of large cities.

Why is this?

On account of the garbage there.

What further use are rats to man?

The skins are sometimes used for gloves.

§ *What use to man are snakes?*

They destroy a vast number of ra mice, and other vermin.

§ *What use are hedgehogs?*

They feed on insects, snails, and birds.

(5.—USE OF NETTLES.)

¶ *What are nettles good for?*

There is no vegetable that grows which can be turned to more uses than the despised nettle.

When young, what can be done with them?

They make an excellent and wholesome table vegetable.

How should they be served up?

Boiled like any other vegetable.

When old, what can be done with them?

If sufficiently abundant, they would make most excellent flax or paper.

If chopped up fine, what are nettles good for?

They make an excellent food for fowls.

When pounded and bruised, what animals are very fond of them?

All horned cattle.

Made into hay, what animals will eat them?

Horses, cows, oxen, and all other animals that eat hay.

How can they be used to give a gloss to the coats of cattle?

A little nettle seed should be mixed with their ordinary food.

For what skin diseases are nettles good?

For rash, and most spring eruptions.

How should they be used?

The tops and young leaves should be made into a tea.

¶ *What use to man are other weeds?*

Many are made into drugs, some are cultivated as garden flowers, and others afford food for cattle or birds.

(6.—USE OF EAST WINDS.)

When Lord Rutherford asked, "What was the use of east winds," what did a shepherd on the Pentland Hills reply?

"They dry the soil, refresh the ewes, and are the will of God."

Why do east winds dry the soil?

Because they sweep over vast tracts of land, but very little water.

What tracts of land do they blow across?

Russia, Prussia, and the Netherlands.

What ocean do they cross?

The narrowest part of the North Sea.

When do east winds prevail?

In early spring, especially in March.

Why are they extremely serviceable at that time of the year?

Because they dry the soil drenched by the snows of January and the February rains.

Why does the earth need drying then?

To fit it for the seed committed to it, and keep the seed from rotting.

If warm west winds blew instead, what evil would vegetation suffer?

The ground would be so wet that the seed committed to it would die, and the autumn crops be ruined.

What else would suffer?

The young of many animals (like lambs) would die also.

What proverbs teach us the value of dry east winds in early spring?

"A dry, cold March never begs bread," and "A bushel of March dust is worth a king's ransom."

What proverbs speak of the evil of warm, wet weather in March?

"A wet March makes a sad autumn," and "March flowers make no summer bowers."

(7.—USE OF BAD SMELLS AND PAIN.)

¶ *What good service do bad smells perform for man?*

Like the rattle of the rattlesnake, they warn us of danger.

Of what danger do they give us warning?

Of the presence of some putrefying substance injurious to health.

§ *What good service does the disagreeable smell of coal gas perform?*

It warns us of the escape of gas, and bids us repair the leakage.

What evil might follow without such warning?

The waste and danger might both be very great.

¶ *What good service does pain perform?*

It warns us of danger, and compels us to bestir ourselves before we suffer fatal injury.

Give an example.

If we put our finger in the fire, pain makes us draw it out again.

Without such pain, what might happen?

Our finger might be burnt off, before we became aware of the mischief.

PART IV.

USEFUL HINTS ABOUT COMMON THINGS.

ACCIDENTS.

(1.—FOR A FROST-BITE.)

If a limb is frost-bitten, what should we do?

Rub it with snow, or bathe it with cold water.

How long?

Till circulation is restored.

What must not be done?

We must neither bathe it with warm water, nor warm it at a fire.

When circulation is restored, what should be done?

The patient should go to bed, and take a little opening medicine.

(2.—CUTS AND WOUNDS.)

§ *If a person has cut himself severely, what should we do?*

Press the lips of the wound together, and wipe them gently.

What next?

While we keep the wound thus closed, a third person should hand us little strips of some adhesive plaister.

What plaister would be best?

Soap or diachylon, warmed.

Why must they be warmed?

Because otherwise they will not stick.

In what way are they to be applied?

They are to be put across the wound, one by one, so as to hold the lips together.

¶ *If the wound is moderately deep, but not very severe, what should we do?*

Press the divided skin gently together; sponge the edges clean with cold water; and bind lint dipped in cold water over the wound.

How much lint is required?

Two or three thicknesses, so as to make a soft cushion.

How long will it be before the wound is healed?

Forty-eight hours.

¶ *If the wound is only slight, what should be done?*

Bind it up in its own blood.

What should be used for binding a wound?

Fine linen rag.

How long should the rag be left on?

Till the wound is well.

§ *What should in* no *wise be ever done?*

Neither butter nor any other sort of grease should ever be applied to a wound.

(3.—STUNNED BY A BLOW.)

If a person is stunned by a blow, what should we do?

Bathe his temples with cold water, or with vinegar and water.

What else should be done?

Hold smelling-salts to his nose.

If this does not restore him, what should we do next?

Give him a slight stimulant, as in a fainting fit (*p.* 233).

If the insensibility still remains, what should we do?

Put mustard poultices on his legs, and send for a medical man.

(4.—STUNNED BY A FALL.)

If a man has fallen from a ladder, and is stunned, what should we do?

Put him to bed at once, and lay hot bottles to his feet.

What should we do next?

Give him, with a spoon, a little brandy-and-water.

About how much?

A tea-spoonful of brandy in a wine-glassful of water.

What else may be done?

Smelling-salts may be held to his nose, but it must be done with great care.

(5.—CURE FOR BRUISES.)

§ *What should be done to an ordinary bruise?*

Bathe it for ten minutes or so with warm water, or milk and water.

How should it be bathed?

With a sponge or soft linen rag.

§ If the bruise is severe, what should be done next?

Bathe it with opium or laudanum.

How should the opium be prepared?

By pouring half a pint of boiling water over two drachms of bruised opium or poppy-heads.

How is it to be applied?

Cold, with a sponge or linen rag.

What may be done instead?

Put a few camomile flowers in a flannel bag, and foment the bruise with the bag dipped in hot water.

(6.—SKIN CHAFED.)

If the skin is chafed off, what should you do?

Puff over the raw place a little violet powder.

If you have no violet powder, what is the next best thing?

A little flour or a little wet starch.

What would improve the flour?

To dry it first before the fire, or in an oven.

(7.—FLEA BITE, BUG BITE, STING, &c.)

What is the most simple cure for the bite of a flea, the sting of a nettle, &c.?

Turpentine, hartshorn, or soda, applied to the wound. •

Why will these things relieve the pain?

Partly because they neutralise the *acid* of the sting.

How else do they act?

They deaden the pain by stimulating the nerves.

Why will soap relieve the pain?

Partly because it contains soda, which destroys the acid of the sting.

How else does soap, spittle, or water act in relieving the pain of a sting?

Chiefly by diluting its poison.

What else will relieve the pain of a sting?

The juice of any aromatic herb, such as thyme, mint, or rosemary.

What is one of the commonest remedies?

Indigo or stone-blue.

(8.—IF ANYTHING STICKS IN THE THROAT.)

§ *If a person has swallowed a stone, piece of money, or any other thing that sticks in his throat, what should we do ?*

Pat him gently with the open hand on his back, between the shoulders.

§ *If this does not give almost instant relief, what should we do next ?*

Lay him down on his stomach, with his head lower than the rest of his body, and pat as before.

What was the object of the first method ?

To force the article down.

What is the object of the second method ?

To bring the article up.

Can anything else be attempted ?

Not without medical aid.

MALADIES.

(1.—CONVULSIONS.)

§ *If a child has convulsions from fright, what should be done?*

The mother should take it on her lap, and soothe it, till it falls asleep.

§ *If a child has convulsions from teething, what should be done?*

Put it into a warm bath for ten or fifteen minutes.

How warm should the bath be?

Just so hot that a woman can hold her arm, from the elbow to the shoulder, in it without pain.

§ *If convulsions proceed from any other cause, what should we do after the bath?*

Give the child a little antimonial wine, and put it to bed.

What is the proper dose?

Five drops in a tea-spoonful of water, sweetened with sugar.

If the child does not fall asleep in two hours, what should be done?

Repeat the dose, and send for a medical man.

(2.—COLDS.)

When tired and heated, what should we do?

Be careful to keep ourselves warm.

What should not *be done?*

We must by no means take any cold drink, or wash in cold water, or strip off any part of our clothing.

What would be the wisest thing to do?

To sit down and rest; but before doing so, to put on extra clothing.

Why should this be done?

Because the skin cools rapidly when the body is weary.

Why does the skin cool rapidly when we are weary?

Because the nervous action of the body is diminished.

What effect will extra clothing produce?

Prevent our catching cold by stopping the rapid cooling of the skin.

What happens when the skin is rapidly cooled?

It closes its pores, and the surface blood is driven to the interior of the body.

Where does it go to?

Some of the small vessels which, of course, get choked up.

How are they relieved?

By runnings at the eyes and nose, cough, and skin eruptions.

§ *What is cold in the head?*

Merely the linings of the nostrils being over-loaded with blood.

What is sore throat?

A similar over-load in the lining of the throat.

What is the usual cause of cough?

An over-load of the same sort in the lining of the chest, or in some of the vessels belonging to it.

§ *How are all these evils relieved?*

By opening the pores of the skin, when the loaded vessels empty themselves.

When are persons most subject to cold?

When they are weary and feeble.

Why so?

Because the nervous power is weakened.

What would increased nervous action do?

Drive the surface blood back again, and open the pores of the skin.

When is this often done?

Of a morning, when we sponge the body with cold water.

What produces the glow which follows this sponging?

Extra vigour of the heart and increased nervous action.

What effect does extra vigour of the heart produce?

By pumping faster it makes the blood circulate more rapidly.

§ *If, when we are very warm, we cannot put on extra clothing, what should we do?*

Keep moving about, till the body has been gradually cooled.

Why should this be done?

Because the exercise will aid the heart in keeping the blood in brisk motion.

§ *What is the best way to get rid of a cold?*

To go to bed as soon as it begins, and keep there till the cold is gone.

Why does going to bed cure a cold?

Because the body gets rested, and the pores of the skin opened.

How do we know when the pores are opened?

By the moisture on the surface of the skin.

Why will a glass of cold spring water sometimes cure a cold?

Because it produces increased nervous action.

§ *Why do damp clothes and wet feet give cold?*

Because they chill the surface skin, and close its pores.

How do they chill the skin?

By drawing off its heat to dry our damp clothes or wet feet.

How does the heat of our body dry wet clothes?

It turns the wet into vapour, which flies off into the air.

(3.—SORE THROAT.)

If a person has sore throat, what should we do?

Soak a piece of ribbon in hartshorn and oil, and fasten it round his neck.

What quantities should be used?

Half an ounce of the spirit of hartshorn with three times as much olive oil. Shake them well together.

What else may be profitably done?

A strip of flannel may be wrapped over the ribbon.

What medicine should be given?

Any simple opening medicine, at bedtime.

(4.—PAIN OF THE EAR.)

If a person has pain of the ear, what should be done?

We should pour a drop or two of sweet salad oil into the ear.

What may be added to the oil?

An equal quantity of laudanum, if at hand.

What medicine should be given?

Any simple opening medicine, at bedtime.

What application is often effectual?

The heart of a roasted onion put into the ear.

(5.—FAINTING FITS.)

If a person faints, what should we do?

Lay him flat on the floor, without raising his head; and loosen his garments about the neck and chest.

If put to bed, what should we do?

Remove the pillow.

What should be done next?

We should splash cold water over his face and chest; and chafe his hands and arms with our hands.

What else should we do?

Let him smell to vinegar or smelling-salts.

(His forehead may also be bathed with *eau de Cologne.*)

If the fit is very obstinate, what else can be done?

We may give him a little brandy and water; or, what is better still, a little ammonia and water.

In what proportions should the ammonia and water be mixed?

Ten grains of powdered carbonate of ammonia in a glassful of water.

What may be profitably added?

One tea-spoonful of brandy.

If the patient is too faint to drink the mixture, what should we do?

Put some of it gradually into his mouth with a small spoon, and he will soon revive enough to take the rest.

¶ *When should fainting* not *be prevented?*

When it arises from bleeding at the nose, or from a wound.

Why should fainting not be stopped in such cases?

Because it stops the bleeding, and gives time for the blood to form a clot over the wound.

What would be most injurious to do in such

To give any sort of stimulant.

What should we do instead?

Let the patient faint, and when the fit passes over put him to bed.

(6.—FAINTING FROM HEAT.)

If a person feels faint from heat, what should we do?

Remove him into a cooler place.

What else should be done?

We should sponge his temples, chest, and hands with vinegar and water.

If no vinegar is at hand, what will do quite as well?

A little lemon juice, or any acid at hand.

What further aid can we render?

We may give him a little acid drink.

If not restored by these means, what further can be done without medical aid?

We may put his feet into water moderately warm.

(7.—BLEEDING FROM THE NOSE.)

¶ *When is bleeding from the nose not important?*

When it happens to children and adults, but not profusely.

Why is it not alarming in such cases?

Because it is a healthy effort of Natur to relieve some of the vessels whic are too full.

Mention some common remedies for bleeding from the nose.

Some dash a little cold water on the face; and some apply something cold to the back of the neck.

What will do instead of cold water?

A large cold key let down the back, or a small morsel of ice.

How do these things act?

By producing a chill, which drives the blood from the bleeding surface.

§ *If the bleeding continues, what should we do?*

Lay the child on its back, and bathe his nose with cold vinegar and water.

What must always be done?

A good current of air must be admitted by opening the door and window.

What should not *be done if we wish to stop the bleeding?*

The child should not be allowed to stoop forward over a basin.

¶ *If bleeding at the nose occurs to those more advanced in life, what should be done?*

If profuse, it should be stopped.

How can it be stopped?

Sometimes a stimulant will stop it, by causing a reaction.

What stimulant would be suitable?

A little ammonia and water, a pinch of snuff, or a little cayenne pepper.

If ammonia is given, what should be the proportions?

Ten grains of powdered carbonate of ammonia in a glass of water.

What may be profitably added?

A tea-spoonful of brandy.

How should the cayenne pepper be given?

In a cupful of warm water, sweetened with a tea-spoonful of sugar.

N.B.—Stimulants may be administered only when the face is *pale* and the health *feeble*. If the face is *red* and the pulse quick, stimulants must *not* be given without medical advice.

WHAT IS TO BE DONE IN CASES OF POISONING.

What is the most ordinary vehicle of poison?

Food or medicine.

If any case of poisoning occurs, what should be done?

The remains of the food or medicine should be carefully preserved.

What for?

That they may be examined.

What besides should be done?

The vessel that contained the food or medicine should be set aside untouched.

What else should be carefully preserved?

Everything that the stomach throws off.

What for?

That a medical man may see it, and examine it.

A GENERAL DIRECTION.

If a person has taken poison, what is the best thing to do in ten cases out of twelve?

Take instantly two gills of sweet oil, which is a remedy for almost every poison likely to be taken.

If no sweet oil is at hand, what is the next best thing?

A pint of good milk.

§ *When a poison is removed, what should generally be done?*

A slight stimulant should be taken.

What sort of stimulant?

A glass of white wine, or of brandy and water.

When would a stimulant be injudicious?

When the poison has been an *irritant*.

Name some irritant poisons.

Arsenic, sulphuric acid, oxalic acid, &c.

(1.—ANTIDOTES TO ACID POISONS.)

What destroys an acid?

An alkali.

Name some common alkalies?

Chalk, whitening, the scrapings of white-washed walls, magnesia, soda, and so on.

Name some liquid alkalies?

Milk, cream, and soapy water.

If a person suffers from an acid poison, what should he do?

Take large quantities of any alkali near at hand.

If a dry alkali is given, how should it be administered?

Dissolved in water or milk.

(2.—POISON FROM PAINTS.)

If children use paints, what caution should be strictly observed?

They should never put the paint to their mouth, or suck the brush.

Why not?

Because paints are poisonous.

If a child is ill from sucking his paint-brush, what should we do?

Give him a dose of Epsom salts, or a Seidlitz powder.

If neither of them is at hand, what should we do?

Give a draught of milk, or the white of an egg in water, or half an ounce of castor oil.

(3.—GRIPES FROM TOO MUCH FRUIT.)

If a person suffers pain from having eaten unripe fruit, what should we do for him?

First make him sick, and then give him medicine.

Why make him sick?

To get rid of the undigested food.

What will produce sickness?

A cupful of oil or butter in an equal quantity of warm water.

Name another simple emetic.

A cupful of warm water slightly sweetened with honey.

Name another.

Half a spoonful of mustard in half a pint of warm water.

How should this last emetic be given?

A cupful must be given, and the dose repeated every half hour till sickness has been abundant.

What medicine should then be given?

A tea-spoonful of the carbonate of soda in a tea-cupful of water.

What may be added?

A little ground ginger, or a tea-spoonful of brandy.

If no soda is at hand, what should be done?

Give instead a good draught of milk, thickened with flour.

What other remedy will do if no milk is at hand?

A cupful of soap-suds, or of chalk and water.

§ *If the cholic is very bad, what should be done?*

A little laudanum in a glass of water should be given.

What is the proper quantity?

As many drops as the patient is years old, provided the quantity does not exceed thirty.

(4.—SAUCEPANS.)

When are copper saucepans poisonous?

Only when not quite clean, or when food is allowed to cool in them.

What sort of foods are most liable to become poisoned by a copper saucepan?

Greasy foods, such as milk and meat.

What other foods become impregnated with the verdigris of copper?

Acid foods, such as jams; and foods containing salt.

(5.—MUSSELS.)

When a person is ill from eating mussels, what should be done?

Let him drink a pint of good milk.

What else?

An hour after give him a slight stimulant, as a glass of sherry, or a little brandy and water.

DISINFECTANTS.

§ *If bins, &c., smell badly, how can the smell be removed?*

By throwing into the bin a bushel of lime.

What produces the bad smell of bins?

The gases given off by putrid animal and vegetable matters.

What does lime do?

It absorbs some of the bad gases, and changes others into substances which do not smell.

§ *What should be kept in a meat-safe, to make it sweet?*

A little charcoal.

What does the charcoal do?

It absorbs the vapours and putrescent odours of animal foods.

§ *If meat is tainted, what should we do to make it fit to eat?*

Rub it well with powdered charcoal, and then wash it in cold water.

If game is full of worms, and too far gone, what should we do to make it good food?

First wash out all the worms, then rub it over well with charcoal, and then wash it quite clean.

§ *If we want to send a present of game to a distance, what is the best way?*

To keep the feathers on, and sprinkle ground coffee between them.

What parts of the game require most attention?

The wounded parts, which should be well covered with ground coffee.

How much coffee would be sufficient for a partridge?

About a couple of spoonfuls.

How must the birds be packed?

In a box or hamper.

MISCELLANEOUS HINTS.

(1.—HOW TO TAKE THE MOST NAUSEOUS MEDICINE.)

How can we take the most nauseous medicine without tasting it?

By touching the tongue once or twice with a piece of alum.

What is the next best thing?

To wipe the tongue quite dry. Without saliva there is no perception of taste.

(2.—PRESERVATION OF EGGS.)

Why should not eggs be greased in order to preserve them?

Because the grease fills up the air-cells of the shell, and destroys the life of the egg.

What ill effect follows?

The egg being dead, tastes rotten and filthy.

(3.—MOULDINESS PREVENTED.)

What is mouldiness?

The growth of minute vegetables.

What substances suffer most from it?

Ink, paste, leather, jams, and seed.

§ *What will preserve articles from mouldiness?*

Any essential oil.

What will keep away mould from ink?

Cloves, or any essential oil.

What will preserve leather from mouldiness?

Oil of turpentine.

Why does not Russia leather become mouldy?

Because it is perfumed by the *tar of birch*, an essential oil.

How can paste be made to keep almost any length of time?

By dropping into it a few drops of the oil of turpentine, peppermint, anise, or any other essential oil.

How should paste be made?

With flour and water, a little brown sugar, and a drop or two of some essential oil.

What is the brown sugar for?

To keep the paste always flexible.

(4.—HOW TO CLEAN SILVER.)

§ *How should you clean old silver coins ?*

Soak them in strong soda and water, and then rub them with whitening.

§ *How can silver greatly tarnished be cleaned?*

By rubbing it with turpentine and whitening.

§ *If not very much tarnished, what will do instead of turpentine ?*

Gin, which contains turpentine.

§ *What will suffice to clean silver in common use ?*

Whitening or rouge.

How should the silver be polished off?

It should be rubbed with a plate brush, and finished off with wash-leather.

§ *How can silver spoons be kept in excellent order ?*

By washing them every day in warm soapsuds, and wiping them dry with a soft cloth or piece of wash-leather.

(5.—TO REMOVE INK-SPOTS.)

How can ink-spots be removed ?

By oxalic acid and water.

What quantities of each should be used?

Dissolve a tea-spoonful of oxalic acid in a cupful of warm water.

How should it be applied?

Dip a feather into the liquid, and touch the spot till it vanishes.

What should then be done?

If paper, pass a damp sponge over the part wet with the acid.

If linen or cotton, what should be done?

Soak the part in clean water.

Why should this be done?

Because the acid would destroy the fabric of the linen or paper, if it were not washed off.

(6.—TO REMOVE GREASE-SPOTS AND PAINT.)

§ *How can paint and grease-spots be removed from clothes?*

By rubbing a little turpentine over the spot.

§ *How can spots be removed from blue, purple, and black silks?*

By rubbing the spots with hartshorn.

(7.—HOW TO CLEAN DECANTERS.)

What is a good, cheap, and effectual way of cleaning decanters?

Put little pieces of torn white paper into them, then add water, and shake the decanters well.

How does this act?

The chlorine of the paper discharges the wine stains.

(8.—HOW TO REMOVE A TIGHT RING.)

If a tight ring is to be removed, what should be done?

Take some half-yard of strong cotton, and pass one end under the ring far enough to give a good hold.

What is to be done with the other part of the cotton?

Twist it closely and pretty tightly round the finger up to the joint. The closer the thread is wound round the finger the better.

What is now to be done?

Hold the end with one hand conveniently, and unwind the thread by the end passed under the ring.

(9.—TO OPEN A STIFF POCKET KNIFE.)

If the blade of a pocket-knife is stiff, what should we do to open it?

Tear off a little strip of ordinary writing paper, and fold it in two.

What is to be done with this strip of paper?

It must be inserted carefully at the fold into the knife-handle, so as to catch the end of the blade.

How is the knife to be opened?

When the blade has been caught, we must pull the paper gently, and the stiffest blade will open easily.

Why will not the sharp knife cut the paper?

Because the knife acts as a saw, and if the paper is kept flat and still, the knife will have no power to cut it.

(10.—HOW TO FIX DRAWINGS.)

How are drawings and pencil-marks fixed?

By holding the paper on which they are made over steam.

How does the steam act?

It melts the *size* which the paper contains.

Why do persons breathe on the pencil-marks of their note-books?

To fix them by melting the size of the paper with their hot breath.

(11.—POCKET-HANDKERCHIEF FOR A COLD, &c.)

If a person has a cold in his head, what handkerchief ought he not *to use?*

A cotton one.

Why not?

Because cotton is a bad conductor, and will not carry off the heat from his eyes and nose.

What sort of handkerchief would give relief?

A linen one.

Why so?

Because linen is a good conductor, and will relieve the inflammation.

What sort of rags should be used to dress wounds with?

Only linen rags, because all wounds are more or less inflamed.

(12.—HOW TO WASH CLOTHES.)

¶ *How should woollens be washed?*

In hot suds, and not rinsed.

How can we prevent their shrinking?

By soaking them for two days in cold water, before they are made up.

§ *How should coloured things be washed?*

In soft water warm, but not boiling hot.

What must be avoided in the water?

The use of soda or pearlash.

Why so?

Because it will injure or destroy the colour.

How should they be rinsed?

In cold hard water, and then dried quickly.

§ *How should muslin curtains be washed?*

First in plain soft water, and then they should be boiled in rice water, or water containing bran.

How should they be got up?

They should be stretched out wet and pinned, or smoothed and pressed.

¶ *Where is linen washed best?*

In the country.

Why so?

Because country air contains a strong bleaching substance called o′zone.

What is used instead to whiten linen washed in towns?

Bleaching powder, because the air of towns has no ozone.

What is the harm of bleaching powder?

It utterly destroys the fabric of clothes.

(13.—PAINT FOR IRON.)

How should iron be painted?

With zinc and not lead colours.

Why not with lead?

Because the air keeps up a galvanic action between the iron and the lead, and the iron wastes away.

What would be the case if zinc paint were used instead?

The action is inverted, and the zinc is eaten away instead of the iron.

Which action goes on the faster?

The former action is rapid, but the latter extremely slow.

(14.—HOW TO CLEAN PAINT.)

What is the best way of cleaning paint?

To rub it briskly with a flannel cloth smeared with whitening.

What is next to be done?

The whitening is to be washed off with *cold* water.

What will be the effect?

The paint will receive a beautiful gloss, and all filth and grease-spots will be entirely removed.

What should not *be done?*

Paint should never be washed with water containing soda.

Why not?

Because soda destroys the paint.

What other caution is essential?

Paint should never be scrubbed with a scrub-brush, though it may be cleaned with a plasterer's brush.

(15.—HOW TO CLEAN CASKS.)

How can foul casks be cleaned?

By rinsing them with a pretty strong mixture of sulphuric acid and water.

What is sulphuric acid often called?

The oil of vitriol.

(16.—TO WARD OFF CATERPILLARS, &c.)

¶ *What insect greatly injures cabbage plants?*

Caterpillars.

What can we do to keep them off?

If we sow the borders of our cabbage ground with hemp, no caterpillar will enter the inclosure.

¶ *How can slugs be easily caught?*

By smearing fresh butter or dripping on warm cabbage leaves, and laying them about the place infested.

What will be the result?

The slugs will be attracted to the greasy leaves, and may be destroyed in any way you think proper.

¶ *How can snails be kept from trees?*

By smearing a ring of charcoal paste round the tree to be protected, a few inches from the ground.

How is the paste to be made?

By mixing powdered charcoal or soot into a paste with common oil.

Why will this protect the tree from snails?

Because no snail will attempt to crawl over such a barrier.

¶ *How can moths be kept from wardrobes?*

By keeping in them cuttings of Russia leather.

What else is a preventive?

Tobacco leaves, only they must be changed every year or two.

(17.—TO BREAK A LUMP OF ICE.)

When ice is to be broken, how can it be done?

Hold the point of a fine needle on it, and tap the needle with a small hammer or the handle of a pocket knife.

What will be the result?

The ice will split easily without spirting about.

(18.—HOW TO FIT STOCKINGS.)

When we buy socks or stockings, how can we tell if they will fit us?

We must double our hand, and the stocking-foot which will exactly fold over our fist, will be the right size.

(19.—THE SIZES OF GLOVES.)

How are gloves numbered?

According to the number of inches round the palm of the hand.

If our hand is seven or eight inches round the palm, what glove is required?

No. 7 or 8, according to the size of our palm.

(20.—TO WATERPROOF BOOTS.)

How can boots be waterproofed?

By melting in a pipkin equal parts of mutton fat, bees-wax, and sweet oil.

How is the mixture to be used?

It is to be smeared on the boots, especially at the welt and seams.

AIR AND EXERCISE.

§ *How many miles a day should a young man walk?*

Five or six.

How many miles a day should a young woman walk?

Three or four.

What is the chief use of exercise?

To work the muscles, and throw more air into the lungs.

How many cubic inches of air do we consume when we sit still?

Five hundred every minute.

How many, if we walk at the rate of two miles an hour?

Double that quantity.

How much, if we walk at the rate of three miles an hour?

More than three times that quantity.

If a young man runs at the rate of six miles an hour, how much air does he consume?

Three thousand cubic inches.

What is meant by consuming air?

Taking air into the lungs that it may mingle with the blood.

What effect has air on the blood?

It changes it to a bright red colour, and keeps up its proper warmth.

§ *What rules should be observed regarding exercise?*

It should never be taken immediately after a meal; nor should a meal be taken directly after violent exercise.

What interval should be allowed in both cases?

About half an hour.

Why should we wait half an hour after a meal before we take exercise?

To give time for the process of digestion to begin its work.

Why should we wait half an hour after exercise before we sit down to a meal?

That the hurry of the circulation may subside, before the stomach is called upon to exert itself.

What exercise is most excellent against all lung diseases?

Singing and reading aloud.

Why are singing and reading aloud good for health?

Because in so doing we take full and frequent draughts of air into the lungs.

Why is it better to take a walk than to pace up and down a garden?

Because it gives the mind and muscles more variety.

Why is it better to walk with a companion?

Because the mind is more unbent, and the exercise of chatting is healthful.

Why should children run?

To exercise their muscles, and fill their lungs with plenty of fresh air.

PERSONAL CLEANLINESS.

Is the skin an unbroken covering or not?

It is not an unbroken covering, but more like a sheet of paper full of little pin pricks.

What are these pin pricks of the skin called?

The pores of the skin.

What do these pores or little holes lead to?

They open into very small tubes which run through the skin to the loose fat beneath.

How many of these pores and tubes are there in the body?

So many that it would take six years to count them, if we counted one a minute.

What is their number?

Three millions.

If all the little tubes were joined together, how far would they stretch?

Twenty-eight miles.

What is their use?

They act as drains and sewers of the body, to carry off waste matter.

What passes out of them?

Dirty water.

How much dirty water is daily drained off from the body by these pores?

From one to three or four pints.

What is the water defiled with?

Decaying and poisonous matter from the body.

How much of such matter is carried off every day?

Not less than a quarter of an ounce.

When the dirty water gets to the surface of the skin, what becomes of it?

It flies off into the air as invisible steam.

How could we prove this?

By putting our naked arm into a glass tube.

How will the glass be affected?

It will soon become quite dull, as if a person had breathed on it.

What would make it so dull?

The steam from our arm.

How are these drains of the skin kept clean?

By washing the skin well.

What is one cause why the skin gets dirty?

The dirt carried to the surface through these drains rests on it, and gets mixed with dust and dirt.

If not washed off, what would happen?

The openings or pores would get choked up.

What would then happen?

The body would not be drained, but the putrid and poisonous matters would flow back into the blood.

What ill results would follow?

Fever, pain, and perhaps death.

London: Printed by Petter & Galpin, Belle Sauvage Works, E.C.

INDEX.

ACCIDENTS, hints on, 220
Acid poisons, antidotes of, 239
Acids, fatty, what, 51
Adulterations of bread, 107
,, ,, butter, 126, 130
Agate, 85
Air and exercise, 259
,, quantity consumed, 259
Albumen, what, 113
,, of meat, 153
Ale, who should drink, 152
Almonds, oil of, 168
Alpaca, what, 19
Alum in bread, 108
effects of, 108
how detected, 108, 117
,, in tanning, 36
Amethyst, 84
,, worn by bishops, 84
Animal charcoal, 46
Ant-acid, 179
Ant-eaters, 201
Anther, what, 190
Antidotes to poisons, 239
Ants, eaters of, 178
,, scavengers, 194, 204
,, skeletons by, 196
,, when abundant, 195
ARKWRIGHT'S twist-frame, 29
Arnotte, 126
,, in cheese, 141
Australian diggings, 90
Austrian diamond, 77
AXMINSTER carpets, 21

Bacon with beans, 135
,, ,, eggs, 134
Bacon with peas, 135
,, ,, potatoes, 133
Badgers eat insects, 201
Baize, 19
Baking, effect of, 116
Balance of Nature, 208
Balsams, fly-catchers, 193
Bannocks, 119
Barberry, how fecundated, 192
Barley bread, 107
Bats, use of, 207
Bean-fly, the, 198
Beans and bacon, 135
Bears eat ants, 201
Bed on fire, 67
Beer, who should drink, 152
Bees eaten, 178
,, fed on sugar, 135
,, sting of, cured, 225
,, wax pockets of, 186
Beetles eat insects, 197
,, scavengers, 194, 204
,, tap gumtrees, 179
,, where abundant, 195
Beetle wine, 177
Bell metal, 94
Benzoic acid, 161
BERMONDSEY tan-yards, 45
Billiard balls, 48
Birds eat insects, 202
,, eggs laid by, 206
,, farmer's friend, 207
,, foolish destruction of, 212
,, use of, 206
,, carrion, 207
,, of prey, 207
BIRMINGHAM, trade of, 45

Birth-wort, how fecundated, 192
Biscuits, 125
Blackbirds, young of, fed, 206
Black dye for leather, 43
,, Jacks destroyed, 205
Blankets, where made, 21
Bleeding nose, treatment of, 235
Block-tin, what, 102
Blood utilised, 171
Blue dye, 25
,, how made, 167, 171
Body, sponging the, 230
,, gives a glow, 230
Boil, how to, 153
BOLTON, cotton factories of, 28
Bombazine, 20
Bone-black, 46
,, use of, 47
Bones, articles made of, 45
,, ,, where made, 45
,, candles made of, 46
,, composition of, 45
,, how to cook, 155
,, refuse, utilised, 160
,, soap made of, 46
,, soup made of, 46
,, used in agriculture, 47
,, use of in a house, 46
Boots made from dead dogs, 174
,, waterproofed, 258
Bottles, use of broken, 163
BRADFORD, Wilts, why noted, 17
,, Yorkshire, ,, 18
Braganza diamond, 74
Bran, use of, 111
Brass, what, 95
,, lacquer for, 184
Bread, adulterations of, 107
,, alum in, 108
,, baking, effect of, 116
,, barley, 107
,, brown, 118
,, butter with, 133
,, composition of, 112
,, ferment for, 111
,, good, how known, 117
,, grain used for, 107
,, heavy, cause of, 116
,, made, how, 114
Bread, unleavened, 119
,, wheat for, 110
Breakfast, what to eat, 146
Bricks made of dust, 169
Broad cloth, 19
Bronze, what, 95
Broth, how to make, 154
Brown bread, 118
,, qualities of, 118
Bruises, how to treat, 223
Buffalo hides, 37
Bug-bite, how to cure, 225
Bugs, use of, 205
Burns, cure for, 69
,, severe, 70
,, slight, 69
BURY, bleaching works of, 29
Butter, 49
,, adulteration of, 130
,, ,, detected, 131
,, cleanliness needed in, 125
,, colour of good, 126
,, coloured, how, 126
,, for food, 132
,, Irish, 129
,, London, how supplied, 128
,, made how, 122
,, not with eels, 134
,, ,, roast fowls, 134
,, packed, how, 126
,, rancid, cause of, 129
,, ,, cured, how, 130
,, requisites in making, 125
,, salt, 126
,, shape of, 124
,, where made, 128
,, with bread, 133
,, ,, boiled fish, 133
,, ,, eggs, 134
,, ,, potatoes, 133
,, ,, rabbits, 134
Button lac, 183

Cabbage fly, 198
,, how to eat, 158
,, poor fond of, 158
CAIRNGORM, 84
Cake needs no butter, 133
Calfskins, how tanned, 37

Calfskins, use of, 38
Calico printing, 27
California, diggings of, 90
Candles, 49
,, composite, 54
,, how made, 55
,, kitchen, 55
,, ,, why dull, 55
,, from bones, 46
,, ,, dead dogs, 175
,, wax, 55
Candle-makers' refuse, 161
Candle-snuff smells, 55
Carat, what, 73
Carbuncle, 79
Carding cotton, 23
,, wool, 14
,, how done, 15
Carpet rags, use of, 164
,, works of Halifax, 19
Carpets partly yarn, 15
,, where made, 20
Carron iron-works, 96
Cart-grease, 163
Casks, how cleansed, 256
Cast-iron, 97
,, use of, 100
Cast-steel, 99
,, use of, 100
Caterpillars cannibals, 199
,, how warded off, 256
,, man's food, 177
,, scavengers, 196, 204
Cats'-meat, 170
Cats eat insects, 201
Cattle fattened by grass, 144
,, why fat, 50
Cauliflowers, poor love, 158
Cells of beehives, 186
Chaff utilised, 169
Charcoal (animal), use of, 161
,, kept in meat safes, 244
Cheddar cheese, 140
Cheese aids digestion, 142
,, Cheddar, 140
,, Cheshire, 138
,, colouring matter of, 141
,, Cottenham, 140
,, cream, 140
Cheese digests food, 142
,, Gloucester, 139
,, Gruyères, 141
,, made how, 136
,, Parmesan, 140
,, properties of, 141
,, ripened, how, 142
,, skimmed milk, 137
,, Stilton, 138
,, Suffolk, 140
,, varieties of, 137
,, whole milk, 137
Cheshire cheese, 138
,, fertilised, 47
Children love sweets, 151
Chimney on fire, 66
Chloroform, 169
,, from ants, 179
,, use of, 179
Chippenham, manufactures of, [17
Chrysalis, 32
Churning, 123
,, use of, 123
Cider, acid of, 132
Cinder-dust utilised, 169
Clean casks, how to, 256
,, decanters, 250
,, paint, 256
Cleanliness, personal, 262
Cleopatra's earrings, 83
,, pearls, 82
Cloth, broad, 19
,, fine, where made, 17
,, Saxony, 12
,, West of England, 17
Clothing metropolis, 18
Clover, how fecundated, 191
Clyde iron-works, 96
Coal-fields, the, 57
Coal-gas refuse, 168
Coals, 56
,, composition of, 58
,, how to put on, 61
,, uses of, 61
,, what are, 56
,, where found, 57
Coburgs, 19
Cocoons, 30
,, how spun, 31

Coccus-cacti, the, 182
,, dye, 181
Cochineal, 182
Cod, where caught, 51
Cod-liver oil, 163
,, whence obtained, 51
Coins, how to clean, 248
Cold, cause of a, 230
,, from damp clothes, 231
,, ,, overheating, 230
,, ,, wet feet, 231
,, in the head, 229
,, treatment of, 228
,, who subject to, 229
Cold-drawn oil, 51
,, imported whence, 51
Colebrook Dale ironworks, 96
Colic, 131
Colouring matter of cheese, 141
Columbia, diggings of, 90
Combing wool, 14
Combs made of bone, 45
,, ivory, 48
Composition candles, 56
Confectionery, 151
Convulsions, treatment of, 227
Cooking, hints on, 153
Copper, 92
,, found, how, 93
,, largest mass known, 94
,, meaning of, 93
,, ore, how known, 93
,, properties of, 93
,, whence obtained, 94
Copper saucepans, 103
Cornelians, 86
,, by whom prized, 86
Cottagers, hints for, 155
Cottenham cheese, 140
Cotton, 22
,, bad for a cold, 252
,, bleached, how, 24
,, carded, 23
,, cloth, 23
,, dyeing of, 25
,, factories, 28
,, grown, where, 22
,, prepared, how, 22, 23
,, rags bad for wounds, 252
Cotton refuse utilised, 166
,, handkerchiefs, 26
Cough, cause of, 229
Country washing best, 254
Coventry ribbons, 35
Cow-house refuse, 167
Cows eat slowly, 149
,, stand in ponds, 203
Crape, 20
Cream, what, 122
,, cheese, 140
,, and milk pans, 131
,, ,, lead and zinc, bad, 131
Crimson, meaning of, 181
Crœsus, wealth of, 91
Crompton's mule, 29
Crows, foolish destruct. of, 212
Cucumbers, how fecundated, 192
Curd soap, how made, 53
Curriers' refuse, use of, 162
Currying leather, 41
Curtains, how to wash, 253
Cut, how to treat a, 220
Cynips, the, 179

Damask, 19
Damp clothes give cold, 231
Dead dogs, uses of, 172
,, horses, uses of, 170
,, wool, 10
Decanters, how to clean, 250
Deerskins dressed, 40
,, ,, uses of, 40
Destruction, foolish, 209
,, of birds, 208, 212
,, crows, 212
,, earwigs, 210
,, flies, 210
,, insects, 208
,, ladybirds, 209
,, moles, 211
,, woodpeckers, 210, 211
,, wrynecks, 210
Devonshire colic, 132
Diamond, Austrian, 77
,, best, how called, 72
,, Braganza, 74
,, cut, how, 73

Diamond, estimated, how, 73
  ,, Koh-i-nor, 74
  ,, largest known, 74
  ,, Orlow, 75
  ,, Pitt, 76
  ,, Pope's, the, 78
  ,, Prussian, 76
  ,, Rajah of Mattan's, 74
  ,, Regent, 76
  ,, Russian, 75
  ,, Sancy, 77
  ,, Star of the South, 75
  ,, whence obtained, 73
Diet, 145
Diggings, the, 89
Dinner, time of, 146
  ,, late, bad, 146
Dips, why so called, 55
Disinfectants, 244
Dogskins, tawed, 39
  ,, uses of, 39
Dogs destroyed in Paris, 174
  ,, eat fast, 148
  ,, meat, 170
  ,, use of dead, 172
Dragon-flies eat insects, 197
Drainings utilised, 167
Drawings, how to fix, 252
Dress on fire, 68
Dresses, incombustible, 68
Dressing leather, 36
Drinking at meals, 151
  ,, rule of, 147
Drowsiness after meals, 147
Dubbing, what, 41
Ducks eat insects, 202
DUDLEY iron-works, 96
Dye, blue, 167
  ,, brown, 167
  ,, from insects, 179
  ,, how made, 166
  ,, lac, 184
  ,, magenta, 168
  ,, mauve, 168
  ,, white, 167

Ear-ache, how to treat, 232
Earwigs eat insects, 168
  ,, foolish destruction of, 210
Earwigs, use of, 204
  ,, where abundant, 199
East winds, use of, 216
Eating, rule of, 147
Eat, what to, 145
Eels full of fat, 133
Eggs and bacon, 134
  ,, butter good with, 134
  ,, greasing bad, 246
Elephants, 48
Emerald, 79
  ,, value of, 80
  ,, whence obtained, 80
Emerald Isle, the, 80
Enamelling leather, 43
Essences, how made, 168
Everlasting (cloth), 19
Exercise needful, 259
  ,, eating after, bad, 260
  ,, quantity for men, 259
  ,, ,, ,, women, 259
  ,, rules for, 260

Face, soils, how, 54
Factory sweepings, use of, 166
Fainting fits, treatment of, 233
  ,, from heat, 234
  ,, how to treat, 233
  ,, when not to prevent, 234
Fancy trade, seat of, 19
Fasting unhealthy, 145
Fat, 49
  ,, makes us warm, 50
  ,, of bones, 46
  ,, whence obtained, 50
Feet, wet, give cold, 231
Ferment, 111
  ,, use of, 111
Ferro-cyanides, 166
Fire, a, 59
  ,, how to feed, 61
  ,, how to poke, 62
  ,, how to act in, 63
  ,, bed-curtains on fire, 67
  ,, chimney on fire, 66
  ,, dress on fire, 68
  ,, house on fire, 63
Fire-damp, 58
Firs, fecundation of, 193

Fish, butter with, 133
,, eat insects, 201
,, use of refuse, 163
Flannel, how to wash, 253
Flea-bite, how to cure, 225
Fleas, use of, 205
Fleece, best part of a, 11
,, worst part, 11
,, weight of a, 13
,, wool, 9
Flesh-flies scavengers, 195, 204
Flesh is grass, 148
Flies, foolish destruction of, 210
,, scavengers, 194
Flock, how made, 164
Flour, different sorts, 110
,, sack of, 117
Flowers, fecundation of, 190
,, female, what, 190
,, male, 190
,, perfect, 190
Fluff, use of, 164
Fly-catchers, 193
Foods and drinks, 107
,, bite them well, 147
,, for cottagers, 155
,, for the sedentary, 149
,, pickles with, 149
,, what, to eat, 145
,, ,, in a hurry, 148
Footmen's cloth, 14
Formic acid, 179
,, ,, use of, 169
Fowls, butter with, 133, 134
Foxes eat insects, 201
French (anecdote) 212
,, polish, 185
Frogs eat insects, 201
Frostbite, cure of, 220
Fruit, grapes from, 241
,, lozenges, 167
Fulling cloth, 16

Gadflies among cattle, 202
Gall-fly, the, 179
Gall-nuts, 179
,, glue, 180
,, use of, 180
,, white, 180
Game, how to pack, 245
,, ,, preserve, 245
Garnet, the, 79
,, whence obtained, 79
Gas, use of its smell, 218
Gelatine, 35
,, use of, 161
Gems, 72
GLASGOW, trade of, 29
Glass, broken, 163
,, soap used in, 163
Glazier's waste, 163
Gloucester cheese, 139
Gloves from dead dogs, 174
,, the size of, 258
,, where made, 45
Glue, 35
,, how made, 161
,, refuse, use of, 160
Gluten, what, 112
Glycerine, 52
,, soap, 53
,, use of, 163
Gnats, use of, 204
Goatskins, how dressed, 40
,, ,, tanned, 37
Gold, 88
,, properties of, 88
,, where found, 89
,, diggings, the, 89
,, mines, 89
,, sand, 90
Goodies for children, 151
Goose fat, use of, 50
Grass in flesh, 143
,, makes fat, 50
Grasshoppers, how eaten, 176
Grease-spots, to remove, 249
GRESHAM'S pearl-draught, 83
Gripes from fruit, cure of, 241
Grubs eaten, 177
Gruyères cheese, 141
Gum ammoniac, 179
,, beetles' tap, 179

Hair utilised, 170
HALIFAX, what noted for, 19
,, carpets of, 20
Handles, bone, 45

Handles, ivory, 48
Handkerchiefs, cotton, 26
Hands soiled, 54
HARGREAVES' "jenny," 29 [191
Heart's-ease, how fecundated,
Heat, cause of, 59 [230
Heated, how to act when, 228,
Hedgehogs eat insects, 200
,, use of, 215
,, in a house, 200
Hides imported, 37
,, not skins, 40
Hogskins, how tawed, 39
,, use of, 39
Holland, what, 24, 25
Honey, best, 187
,, Chamouni, 188
,, colour of, 188
,, Greek, 188
,, rock, 188
,, use of, 188
,, wild, 188
Honey-dew, what, 198
Hoofs utilised, 171
Hoops, use of old, 168
Hop-fly, 198
Hop-growers' friend, 198
Hornets eat insects, 197
Horse shoes utilised, 171
,, tongue eaten, 171
,, use of a dead, 170
House on fire, what to do, 62
,, cautions, 65
,, directions to inmates, 63
,, ,, to masters, 65
Households (flour), what, 111
House-sweepings used, 169
HUDDERSFIELD, why noted, 19
Humble-bees, use of, 191
HYBLA, honey of, 187
HYMETTUS, honey of, 187

Ice, how to break, 257
Ichneumon-flies, use of, 199
,, clear turnips, 204
Ignorance, mischief of, 209
Indigo for dye, 25
Ink-spots, how to remove, 248
Insects, botanical uses of, 189
Insects, counterchecks, 197
,, direct use of, 204
,, eat animal matter, 204
,, ,, insects, 197
,, ,, vegetable matter, 204
,, fertilise trees, 193
,, for dye, 179
,, food for birds, 200
,, ,, men, 176
,, indirect use of, 204
,, land scavengers, 204
,, medicinal use of, 178
,, revive in spring, 209
,, scavengers, 194
,, sleep in winter, 209
,, uses of, 176
,, water scavengers, 204
Insensible perspiration, 263
IRELAND, Emerald Isle, 80
Iris, how fecundated, 191
Iron, cast, 97
,, uses of, 110
,, character of, 95
,, districts, 96
,, found, where, 95
,, paint for, 254
,, pig, 97
,, puddling, 97
,, refuse, utilised, 168
,, works, chief, 96
,, wrought, uses of, 100
Iron-blues, 166
Isinglass, how made, 163
,, use of, 163
Ivory, articles made of, 48
,, quantity imported, 48
,, used in pastry, 49

Jam good for children, 151
,, how to make, 158
,, ,, preserve, 159
,, mould of, 159
Jasper, 86
,, shrine of, 86
Jelly from dead dogs, 174
,, ,, ivory, 49
"Jenny," spinning, 29
Jet, meaning of, 87
,, where found, 88

Jewels, 72
Jumping from a window, 65

Kalmias catch flies, 193
Kermes dye, 181
Kerseymere, 19
Kestrels eat insects, 202
,, ,, mice, &c., 207
Kid, how tawed, 39
,, use of, 39
,, what, 44
Kidderminster carpets, 21
Killas, what, 94
Kings, three, of Cologne, 87
Kitchen candles, 55
,, ,, give bad light, 55
,, refuse, use of, 163
,, smell, 55
Kneading butter, 124
,, flour, 114
Knife cuts, how, 251
,, how to open a stiff, 251
Koh-i-nor, 74

Lac, 182
,, button, 183
,, dye, 184
,, lake, 184
,, lump, 184
,, seed, 184
,, shell, 184
,, stick, 183
,, uses of, 184
Lacquer, 184
,, yellow, 184
Ladybirds eat insects, 198
,, foolish destruction of, 209
,, uses of, 204
,, where abundant, 199
Lains, 19
Lambskins, how tanned, 37
,, use of, 39
,, whence imported, 38
Lancashire, noted for cottons, 28
Lard, what, 49
Latent heat, 59
,, ,, effects of, 60
Lead, 104
,, for milk-pans, 131
Lead found, how, 105
,, mines, the best, 105
,, pigs of, 105
,, properties of, 105
,, uses of, 105
,, white, 106
Leather, blackened, how, 42
,, currying, 41
,, dressing, what, 36
,, ,, how done, 44
,, made, how, 35
,, patent, what, 38
,, refuse utilised, 161, 162
,, Russia, 39
,, sumaching, what, 42
,, tanning, what, 36
,, ,, how done, 40
,, tawing, what, 36
,, ,, how done, 43
,, trade, seat of, 45
,, whence imported, 38
Leaven, 112
Leeds, clothing metropolis, 18
,, manufactures of, 18
Leominster, gloves of, 45
Limerick, gloves of, 45
Linen for a cold, 252
,, ,, wounds, 252
,, why it soils, 54
Lip-salve of dead dogs, 173
Livery wool, 13
,, use of, 14
Lizards eat insects, 203
Loaves best small, 113
,, how many per sack, 117
Locusts, how eaten, 176
,, scavengers, 196, 204
London a glove mart, 45
,, a shoe mart, 45
Lucifer matches, 171
,, from bones, 47
Lump lac, 184

Macclesfield silks, 35
Magenta dye, 25
,, how made, 168
Maji, the three, 87
Malachite, 87
,, doors, 87

Maladies, treatment of, 227
Malleable, what, 98
Man cannot eat grass, 144
MANCHESTER, cotton metrop. 28
  ,, silks, 35
Mane, horse's, use of, 170
Manure, bone, 47
Masticating food, 147
Mauve dye, 25
  ,, how made, 168
Meals, hurried, 148
Meat, coarse, cooked,
  ,, eaten with bread, 155
  ,, how to cook, 153, 154
  ,, tainted, cured, 244
  ,, tough, 155
  ,, why cooked, 153
Meatsafe kept sweet, 244
Medicine, how to take, 246
Melons, how fecundated, 192
Merinoes, 15
MERTHYR TYDVIL ironworks, 96
Metals, 88
  ,, refined, 47
Milk and cream pans, 131
  ,, ,, of lead nd zinc, 13
  ,, with arrowroot, 133
  ,, ,, rice, 133
Moles eat insects, 200
  ,, foolish destruction of, 211
  ,, uses of, 200
Moreen, 19
Morocco, 37
  ,, reddened, how, 42
  ,, use of, 38
Mother-of-pearl, 83
  ,, uses of, 83
Moths kept from books, 39
  ,, ,, wardrobes, 257
Mouldiness, what, 159
  ,, prevented, 246
Mule (cotton), 29
Muslin curtains, to wash, 253
Mussels, poisoning from, 243
Mutton and turnips, 135

Nails, use of old, 168
Nap, how made, 17
Naples soap, 53
Native metal, what, 91
Nectar, how made, 168
Nettles, how fecundated, 192
  ,, use of, 215
NEW YORK (anecdote), 212
NORTHAMPTON, a shoe mart, 45
NORWICH, a shoe mart, 45
Nose, bleeding, how to treat, 235
  ,, ,, in adults, 236
  ,, ,, in children, 235
Nuggets, what, 89
Nut-galls, 180

Oaten cakes, 119
Oil, cod-liver, 51
  ,, cold-drawn, 51
  ,, converted to acid, 52
  ,, differs from suet, 52
  ,, train, 50
  ,, use of, 50
  ,, with salad, 150
Oleanders catch flies, 193
Oleic acid, what, 52
Oleine, what, 52
Onions, poor fond of, 158
  ,, salt with, 157
  ,, with rabbits, 134
Onyx, 85
Opal, 85
Ore, what, 92
Orleans cloth, 19
Orlow diamond, 75
Owls, what they eat, 206
Oxen, fattened on grass, 144
  ,, fat, why, 50
  ,, stand in pools, 203
Ox-hides, whence imported, 37

Pactolus, 91
Pain, benefit of, 219
Paint, how to clean, 255
  ,, for iron work, 254
  ,, how made, 166
  ,, poisoning from, 240
  ,, removed from clothes, 249
Paisley shawls, 21
Pampas, the, 37
Paper knives, bone, 45

Paper made of refuse, 166
Paramatta, 19
Parmesan cheese, 140
Partridges eat ants, 202
Paste, how to keep, 247
,, ,, make, 247
Pastoral ring, 84
Pastry made of ivory, 49
,, ,, dead dogs, 174
Pastry-whites, what, 110
Pearls, Cleopatra's, 82
,, estimated, how, 82
,, found, how, 81
,, Gresham's, 83
,, Jews value, 82
,, meaning of, 82
,, obtained, how, 81
,, produced, how, 81
,, Romans valued, 82
Peas, how to boil, 158
,, with bacon, 135
Pencil marks, how to fix, 252
Perfumes, how made, 163
,, from dead dogs, 172
Perspiration, insensible, 263
Pewter, what, 104
Pickles, use of, 149
Pies eat locusts, 202
Pigeons, caution against, 205
Pig of iron, what, 97
,, of lead, what, 105
Pigs eat insects, 201
Pinchbeck, what, 189
Pistil, what, 189
Pitt diamond, the, 76
Plant-lice, 198
,, what devour, 198
,, what they devour, 198
Pocket-handkfs. for colds, 252
Poison from acids, 239
,, ,, fruits, 241
,, ,, mussels, 243
,, ,, paint, 240
,, ,, saucepans, 242
Poisoning, what to do, 238
,, general directions, 239
Polecats, use of, 214
Policemen, cloth for, 14
Pollen, 190
Pollen, use of, 190
Pope's diamond, the, 78
Poplars, how fecundated, 193
Poplins, 20
Pores in the skin, 262
,, use of the, 262
Pork with beans, 135
Port wine dregs used, 168
Potato-fly, 198
Potatoes, butter with, 133
,, how to cook, 156
,, in bread, 107
POTOSI mines, 92
Pots, how tinned, 104
,, why tinned, 103
Poultry eat insects, 202
,, in cattle-yard, 202
Precious stones, 72
Prince's metal, 95
Prison, cloth for, 14
Propolis, 186
Prussic acid, how made, 166
,, makes blue, 167, 171
,, ,, brown, 167
,, ,, white, 167
Prussian blue, 167
,, diamond, the, 76
Puddings, 151
Puddling, what, 97

Rabbits, butter with, 134
,, onions with, 134
Rags, re-used, 164
Rajah of Mattan's diamond, 74
Rancid butter, 129
,, how cured, 129
Rats, use of, 214
,, where most numerous, 214
Raw silk, 31
,, whence imported, 33
Red dye for leather, 42
Refuse and waste, 160
,, bones, 160
,, candle-makers', 161
,, curriers', 161
,, glue, 160
,, soap-makers', 162
,, tanners', 161
Regent diamond, 76

Rennet, what, 136
Reps, 18
Rhododendron, 193
Ribbons, where made, 35
Rice in bread, 107
  ,, milk good with, 133
Rickets, cause of, 109
Rings, amethyst, 84
  ,, tight, how to remove, 250
Roan, 38
  ,, how reddened, 42
  ,, what used for, 38
Roast, how to, 153
ROCHDALE blankets, 21
Rock honey, 188
Rooks eat insects, 202
  ,, follow the plough, 202
ROTHERHAM iron-works, 96
Ruby, 78
  ,, largest, the, 79
  ,, value of the, 79
RUSSIA iron-works of, 97
Russian diamond, 76
Russia-leather, 39
  ,, ,, keeps off moths, 39
Rye-bread, 107

Sailors' cloth, 14
Salads, 149
  ,, how to mix, 150
  ,, oil with, 150
Salt with onions, 157
  ,, vegetables, 157
Sancy diamond, 77
Sand-wasps, 197
Sapphire, 80
  ,, finest, where, 80
  ,, value of, 80
  ,, whence obtained, 80
Sard, 86
Sardonyx, 85
  ,, meaning of, 86
Saucepans, poison from, 242
Saxony cloth, 12
Sawdust utilised, 169
Scalds cured, severe, 70
  ,, slight, 69
Scavengers, Nature's, 194
  ,, ,, land, 204
Scavengers, Nature's water, 204
Scones, 119
Scorpions cannibals, 199
Sealing-wax, 185
  ,, how coloured, 185
Sealskins, enamelled, 43
  ,, tanned, 37
  ,, uses of, 38
Seconds flour, 110
Seidlitz powder, 168
Selvage utilised, 164
Serge made of worsted, 19
Shalloon of worsted, 19
  ,, partly of yarn, 15
Shammy leather, 40
Shawls, where made, 21
Shear hammers, what, 99
Shearing living sheep, 10
Shear steel, 99
  ,, use of, 101
Sheep, black-faced, 12
  ,, black face and legs, 12
  ,, fattened by grass, 144
  ,, fat, why, 50
  ,, long-woolled, 11
  ,, shearing of, 10
  ,, short-woolled, 11
  ,, slow eaters, 149
Sheepskins, how dressed, 40
  ,, how tanned, 17
  ,, uses of, 38, 40
  ,, whence imported, 38
SHEFFIELD, bone ware of, 45
Shell-lac, 184
Shoddy, 165
  ,, chief manufactories, 165
  ,, refuse utilised, 165
  ,, wash utilised, 165
Shoes waterproofed, 258
Shoe trade, chief marts, 45
Shrine of jasper, 86
Silk cocoons, 31
  ,, manufacturers, 33
  ,, produced, how, 30
  ,, refuse utilised, 166
  ,, weavers, 34
  ,, whence imported, 32
Silk-lace, 35
Silk-mills, the first, 35

Silk-worms eaten, 178
,, the rearing of, 32
,, why not in England, 33
Silver, how found, 91
,, how to clean, 248
,, properties of, 91
,, the best mines, 92
Size, refuse, utilised, 160
Skate need butter, 134
Skeletons by ants, 196
Skin chafed, how to cure, 221
,, number of pores, 262
,, why it gets dirty, 264
Skins made leather, 35
,, not hides, 40
,, of dead dogs, 174
,, ,, horses, 170
,, refuse, utilised, 170
Slaughter-house refuse, 166
Sleeping after meals, 145
Slugs, how to catch, 256
Smell of wicks, 55
Smelling salts, 172
Smells, use of bad, 218
Snails, use of, 214
,, warded off, 257
Snakes eat insects, 201
,, use of, 215
Soap, 49, 51
,, best, 53, 55
,, chaps, 54
,, cleans, how, 54
,, from bones, 46
,, ,, dead dogs, 175
,, glycerine, 53
,, Naples, 53
,, of soap suds, 165
,, soft, 53
,, yellow, 53
,, uses of, 53
Soap-makers' refuse, 161, 162
,, a manure, 164
Soap-suds made soap, 165
Soda used in washing, 54
Soft soap, 53
Soldiers, cloth for, 14
Soles not curried, 41
Sore throat, cause of, 229
,, how to treat, 231
Soup, bones good for, 46
,, from dead dogs, 173
South-Down sheep, 11
Sow (a), what, 97
Spanish-fly, use of, 178
Sparrows eat insects, 203
,, how many they eat, 206
Spiders eaten, 178
,, eat insects, 197
,, ,, spiders, 199
SPITALFIELDS weavers, 34
Sponge (bread), 115
Sponging the body good, 230
Spots made in cloth, 25
Spun silk, 31
Squirrels eat insects, 201
Stable refuse utilised, 167
Stamens, what, 189
Stapling wool, 13
Star of the South, the, 75
Starch, what, 113
Stearic acid, what, 52
Stearine, what, 52
Steel, cast, what, 99
,, shear, what, 99
,, tempered, how, 98
,, uses of, 100, 101
Stick lac, 184
Stigma, what, 189
Stilton cheese, 138
Stimulants, when dangerous, 237
,, ,, useful, 237
Stings, how to cure, 225
Stoats, use of, 214
Stockings, how to fit, 258
STOCKPORT cotton factories, 28
Stones, precious, 72
Stream tin, 102
STROUD, why noted, 17
Stuffs, 15
Stunned from a blow, 222
,, ,, fall, 223
Styles, what, 189
Suet, what, 49
,, differs from oil, 52
Suffolk cheese, 140
Sugar, a food, 150
,, bleached, 47
,, for children, 151

Sugar, for the hungry, 150
,, refined, 174
Sumach tanning, 37, 42
Super wool, 13
,, use of, 14
Supper, who may eat, 147
Swallows eat insects, 203
,, how many, 206
,, fly high, 203
,, ,, low, 203
Sweepings utilised, 166
Swine eat insects, 201

Tablets of ivory, 48
Tail, horse's, use of, 170
Tainted meat, how to cure, 244
Tallow, what, 50
Tanner's refuse, use of, 161
Tanning, 36
,, how performed, 43
,, with alum, 36
Tar refuse, use of, 168
Taste, how to blunt, 246
Tawing leather, 36, 39
Tea aids digestion, 147
Teazing cloth, 16
Teazles, what, 16
Tendons, horse's, utilised, 170
Thirds flour, what, 111
Throat, sore, cause of, 229
,, ,, how to treat, 231
,, sticking in, 226
Thrushes eat locusts, 202
,, feed their young often, 206
Tin, block, 102
,, how found, 102
,, mines, 103
,, plate, 104
,, properties of, 103
,, stream, 102
Tinned, why pots are, 103
Tinning, how done, 104
Tight ring, how to remove, 250
Titmouse, its young fed, 206
Toad-flax, fecundation of, 192
Toads eat insects, 201
Tola dye, 181
Tongue, horse's, eaten, 171
Tooth brushes, 48
Topaz, 84
,, whence obtained, 84
Tortoises eat insects, 201
Train oil, 50
,, uses of, 50
TROWBRIDGE, why noted, 17
Tungstate, what, 68
Turkeys eat insects, 202
Turnip-fly, 198
Turnips, manure for, 47
,, with mutton, 135
Twill, 18
Twist frame, the, 29

Unleavened bread, 119

Varnish, 184
Vegetables for food, 143
,, how to cook, 157
,, insects that eat, 196
Venice turpentine, 185
Verdigris, 93
,, use of, 93
Vermillion, 181
Virgin honey, 188

Waistcoatings, where made, 2
Walk, how to take a, 261
,, companion desirable, 261
Warmth from fat, 50
Warp, what, 24
Wash clothes, how to, 253
,, flannels, 253
,, muslin curtains, 253
Washerwomen use soda, 54
Washing, country, best, 254
Wasps eat insects, 197
,, how to cure the sting, 22
Waste, use of, 160
,, *see* Refuse
Water bugs, 199
,, use of, 204
,, kept pure, 196
Waterproofing boots, 258
Wax, colour of, 186
,, how made, 185
,, use of white, 18
Weasel, use of, 214
,, why killed, 214

Weeds, use of, 216
Weevils destroyed, 205
Weft, what, 24
West of England cloths, 14
Wet feet give cold, 231
Whale fisheries, the chief, 51
Wheat, best, where grown, 109
,, for bread, 107
,, how prepared, 110
White-lead, what, 106
Willows, fecundation of, 193
Wilton carpets, 20
Wiltshire cloth, 17
Window, jumping from, 65
,, how to throw a child, 66
Winds, east, use of, 216
Wine from beetles, 177
,, makes sober, 168
,, who should drink, 152
Witney blankets, 21
Woodpeckers, kill not, 210, 211
,, use of, 207
Wool, Australian, 12
,, carding of, 14
,, combing of, 14
,, dead, 10
,, English, 12
,, ,, use of, 13
,, fleece, 9
,, German, 12
,, ,, use of, 12
,, grey, use of, 14
,, livery, use of, 14
,, long, 14
,, ,, use of, 10
Wool, manufacture of, 15
,, obtained, how, 9
,, refuse, use of, 13
,, Saxony, 12
,, short, best, 10
,, carded, 14
,, ,, use of, 10
,, Spanish, 13
,, stapling of, 13
,, super, use of, 14
Woollen manufactures, 17
Woollens, how to wash, 253
Woolstapler, 13
Worcester, gloves of, 45
Workhouse cloths, 14
Worms, use of, 213
Worsted manufactures, 17
,, wool for, 12
Wounds, how to treat, 220
Wrynecks, kill not, 210, 211
,, use of, 202
Yarn, 14
,, goods made of, 15
Yeast, 111
,, in bread, 111
Yeovil gloves, 45
Yorkshire cloths, 18
,, woollens, 18
Zinc, character of, 101
,, merits of, 102
,, milkpans of, 131
,, paint from, 254
,, separated, how, 101
,, uses of, 102
,, where found, 101

Petter and Galpin. Belle Sauvage Printing Works, Ludgate Hill, E.C.

CASSELL'S
EDUCATIONAL WORKS

A CATECHISM OF LATIN GRAMMAR Fcap. 8vo, cloth boards, 1s.

FIRST LESSONS IN LATIN. By Professor ANDREWS and STODDARD. 12mo, paper covers, 1s. cloth, 1s. 6d.

LESSONS IN LATIN. By the Rev. J. R BEARD, D.D. 12mo, paper covers, 2s. 6d.; cloth 3s.

KEY TO THE LESSONS IN LATIN. 12mo paper covers, 1s.; cloth, 1s. 6d.

THE LATIN GRAMMAR. For the Use o Schools and Colleges. By Professors ANDREWS and STODDARD. Crown 8vo, cloth, 3s. 6d.

THE LATIN READER. 12mo, cloth, 1s. 6d.

CASSELL'S LATIN EXERCISES. 12mo, cloth, 2s.

CASSELL'S LATIN-ENGLISH AND ENGLISH-LATIN DICTIONARY. By J. R. BEARD, D.D., and C. BEARD, B.A. Small 8vo, 7s. 6d., cloth; strongly bound in leather, 9s.

LESSONS IN ITALIAN. By CHARLES TAUSENAU, M.D. of the University of Pavia, and Professor of the German and Italian Languages. 12mo, in stiff covers, 3s.; cloth, 3s. 6d.

LESSONS IN GREEK. By the Rev. J. R. BEARD, D.D. 12mo, in stiff covers, 3s. 6d.; cloth, 4s.

THE ACTS OF THE APOSTLES IN THE ORIGINAL GREEK. By JOHN J. OWEN, D.D. 12mo, cloth, 2s. 6d.

CASSELL, PETTER, & GALPIN, LUDGATE HILL, E.C.

CASSELL'S

EDUCATIONAL WORKS.

KEY TO THE EXERCISES IN CASSELL'S LESSONS IN FRENCH. 12mo, paper covers, 1s.; cloth, 1s. 6d.

CASSELL'S FRENCH MANUAL. By Professor DE LOLME. Crown 8vo, cloth, 3s.

THE FRENCH READER. New Edition, by Professor DE LOLME. 12mo, paper covers, 2s.; cloth, 2s. 6d.

FRENCH-ENGLISH AND ENGLISH-FRENCH DICTIONARY. By Professors DE LOLME and WALLACE, and HENRY BRIDGEMAN. Small 8vo, in 1 vol., cloth, 7s. 6d.; or strongly bound in leather, 9s.

CASSELL'S LESSONS IN GERMAN. By W. H. WOODBURY. 12mo. Parts I. and II., paper covers, 2s.; cloth, 2s. 6d. (each); complete in 1 vol., cloth, 4s. 6d.

KEY TO THE LESSONS IN GERMAN. Revised Edition. 12mo, paper covers, 1s.; cloth, 1s. 6d.

THE PRONOUNCING GERMAN READER. Consisting of Extracts in Prose and Verse, with appropriate Vocabularies. 12mo, paper covers, 1s.; cloth, 1s. 6d.

THE GERMAN READER. By W. H. WOODBURY. 12mo, paper covers, 2s.; cloth, 2s. 6d.

THE GERMAN-ENGLISH AND ENGLISH-GERMAN PRONOUNCING DICTIONARY. Small 8vo, cloth, 7s. 6d. Strongly bound in leather, 9s.

LESSONS IN SPANISH. Revised by the Editor of the "POPULAR EDUCATOR." 12mo, cloth, 3s. 6d.

CASSELL PETTER, & GALPIN, LUDGATE HILL, E.C.